INSTRUCTION BOOK

Type TA-18BB TRANSMITTER

BENDIX RADIO
DIVISION OF BENDIX AVIATION CORPORATION
BALTIMORE 4, MARYLAND

I.B. 708A

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February 1958

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ADDENDA

Page 2-1.

Table 2-1 is changed as follows:

SWITCH POSITION	APPROXIMATE READING	ALLOWABLE LIMITS	
		MINIMUM	MAXIMUM
Low frequency oscillator grid current	0.75 ma	0.2	1.00
High frequency oscillator grid current	0.4 ma	0.1	0.5
Doubler grid current	1.25 ma	0.6	2.0
Doubler cathode current	55 ma	40	60
Tripler grid current	8 ma	4	10
Tripler cathode current	115 ma	90	150
P.A. grid current	14 ma	5	20
P.A. cathode current	225 ma	135	225
Modulator cathode current	175 ma 95 per cent modulation	120	200

Correct the note to read as follows:

If the meter readings correspond to the ones listed above, the transmitter power output should be approximately 35 watts, but not less than 25 watts on any one channel.

Page 4-2.

The Bendix part number of dynamotor start relay K4 is changed to L218832-1. (Replacement relay requires a modified mounting.)

Page 4-5.

The driver feedback resistor, R305, is changed to 2400 ohms, ±10 per cent, 1/2w, comp. The Bendix part number is changed to RC20GF242J. (This change increases the modulation level.)

Page 4-6.

The name of part and description of modulation transformer T304 is changed as follows:

Pri. 6200 ohms, sec plate 2670 ohms, screen 7920 ohms, sidetone 300 ohms; nominal level 32.5w; turns ratio-pri. to plate 1.46:1; pri. to screen 3.06:1; pri to sidetone 76:1; d-c resistance pri. 80 ohms; sec. plate 40 ohms, screen 170 ohms, sidetone 1 ohm.

17M TA 18

21 — spare ——— MCWKET
7 — A ——— K
8 — B ——— L
9 — C ——— M
10 — D ——— N
11 — J ——— O
12 — K ——— LITE *

13 — NOR ch same
14 — ARM same
15 — NORM OPEN same
16 — COMMON WITH PIN 2
17 — RESERVED
18 — SIDETONE (MAY BE GRounded
19 — SIDETONE
20 MIKE AUDIO INPUT
21 — SPARE
22 — L WIRE } FREQ CONTROL
23 — M WIRE }
24 — 115 V 400CPS
25 — Spare
26 — MIKE CONTROL
27 — +27.5 V Control Ckts
28 — RCVR DISABLE CONTROL
29 — SPARE
30 — SPARE

3 — P
4 — 9
5 — R
6 — 5

2 — 27.5 V fil
1 — Gnd
A1 — Reserved
A2 — 27.5 V DYN

BS-284 SPECIFICATION

Procedure for Modification of Aircraft Transmitter
TA-18BB to TA-18C

OR 669756	Schematic	OR 286312	Schematic	PREPARED	CHECKED
DRAWING	TITLE	DRAWING	TITLE	P Roberts	
DRAWINGS LISTED ABOVE ARE PART OF THIS SPECIFICATION				TYPED 10-20-54	APPROVED E Weigel

BENDIX RADIO

[illegible]

[illegible] Parts Deleted

Switch Wafer (next to chassis)	[illegible]
Switch Wafer	[illegible]
Relay	[illegible]

New Parts Added to Make a 2A-18C

Switch Wafer	L218696
Switch Wafer	L218699
Relay	C218259-1
Capacitor .01 mf mica	CM35B103M
Resistor 22K ohms 1/2 W.	RC20BF223K
Terminal Stud	C29381G-2
Screws 6-32 x 3/16"	[illegible]

[illegible]

A. Set selector at 118.5 mc.
B. Unsolder mixer plate leads.
[illegible] assembly in place.
Lift crystal switch assembly from transmitter and put in a safe place.
E. [illegible]
Lift clear of switch shaft.

II. Modify transmitter for 6 mc shift.
A. Place new S2A,B wafer, Bendix Part #L218698, onto switch shaft with rotor "X" mark facing away from chassis, taking care that rotor is aligned same as in Step II E.
B. Beginning with the Red wire, remove, one at a time, the wires from contacts 1 to 4 in order of clockwise rotation on S2, Bendix Part #L243270 and solder them to contacts 1 to 4 in order of clockwise rotation on S2A Bendix Part #L218698.
NOTE: S2 wafer, Bendix Part #L243210 is the wafer which was next to chassis. (The corresponding front and rear contacts of the S2A/B wafer, Bendix Part #L218698, jumper together).
C. Remove common wire from wiper contact of S3, Bendix Part #L243205 and solder it to wiper contact of S2B, Bendix Part #L218698.
D. Remove and discard S2, Bendix Part #L243210.
E. Beginning with the yellow-black wire, remove, one at a time, the wires from contacts 1 to 4 in order of clockwise rotation on S3, Bendix Part #L243205 and solder them to contacts 4 to 7 in order of clockwise rotation on S2A, Bendix Part #L218698. (Note that this results in two wires plus jumper on contact 4).
Discard S3 Bendix Part #L243205.
G. Install new S3 wafer, Bendix Part #L218699, making sure that rotor is correctly aligned per schematic OR059756.
H. Connect wiper contacts of S3A and S3B to wiper contact of S2B.
Install K3 [illegible] in place of old relay, Bendix [illegible]
J. Transfer all wires from K3 Bendix Pt. #0218259-3 to corresponding terminals on K3 Bendix Pt. #0218259-4. There will be 1 extra pair of contacts on the new relay.
K. Run wire from terminal P of K3 through cable to short clip on S3B.
L. Wire terminal N of K3 to terminal D of K3.
M. Remove wire from terminal #20 of Jones plug P1 and solder it to terminal #18.
N. Run wires from alternator contacts of S3A through cable to terminals #16 and #20 of P1. (When mc switch is on even mc, pin #20 is shorted to common of S3A.
P. Run wires from J1 to rear plug as follows:
1. Terminal #18 of J1 to terminal #29 of rear plug.
2. Terminal #36 of J1 to terminal #23 of rear plug.
Q. Test 6 mc shift operation by grounding #29 at rear plug.
R. Reset selector to 118.5 mc and replace crystal switch assembly.

[illegible] terminal board and 5.6" and [illegible]
[illegible] Move wires just enough to clear terminals.
[illegible] from ground and solder to terminal A
[illegible]

9 Unsolder cadmium resistor, R27, from ground and solder it to terminal B. (See sketch)

11 Solder resistor, R229 between terminals A and B.

10 Wire condenser, C280 from terminal A under terminal board to ground lug.

10 Run wire from terminal B to +27.5 volt terminal on antenna [illegible]

Run wire from terminal A to pin #21 on rear plug.

Test ATUSS keying function as follows:

Start the transmitter and check for normal output. Grounding Pin #21 on rear plug should reduce the power output to zero.

THE Bendix CORPORATION

BENDIX RADIO DIVISION • BALTIMORE 4, MARYLAND

January 29, 1962

Mr. Langner
Flight Electronics
West Chester County Airport
White Plains, New York

Dear Mr. Langner:

After checking through our records, I can not find a service bulletin to cover either the modification for 50 kc spacing or SCS to DCS on the TA-18BB. However, I am enclosing modification specification BS-284 which outlines the parts and procedure required for the 6 mc shift required for DCS operation.

The modification for 50 kc operation can be found in Section II, Page 2-1 of the TA-18BB Instruction Book I.B. 708A. The ten low frequency crystals required can be obtained from Avionics Sales Department 281, Mr. Al Erskine.

I hope this information will be helpful. If any further assistance is required, please let us know.

Very truly yours,

H. E. Utz
Senior Technical Writer
Avionic Products

mk
enc.

1-30-62

A 1 — NOT USED

1 — gnd

2 — 24 V

3 — E — P (5)

4 — F — 9 (6)

5 — G — R (4)

6 — H — S (8)

7 — A — K (1)

8 — B — L (7)

9 — C — M (3)

10 — D — N (2)

11 — J — O (10)

12 — K ON 17 M = FREQ WIRE K (ON TA16 = LIGHT)

13 —

14 —

15 —

16 — TO PIN 2 (27 V)

17 — NOT USED (13.5 V) BOTH

18 —
19 — }

20 —

21 — NOT USED

22 — L WIRE FREQ 17 M NOT USED ON TA16

23 — M WIRE FREQ 17 M NOT USED ON TA16

24 — 115 V ON 17 M NOT USED TA16

25 —

26 — MIKE CONTROL

27 + 27 V

28 — DCVR DIS CONTROL 17M NOT USED TA16

29

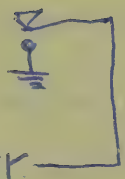
30

A 2 — 24 V

TA
P6
↓

Common
DPD
32 contact

TA 18



21 — MCW KEY — AA and BA only

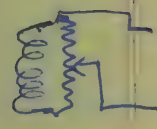
1	7	K	MC SEL
2	8	L	
3	9	M	
4	10	N	
10	11	O	
5	3	P	1/10 MC
6	4	Q	
7	5	R	
8	6	S	

118 — 135 MC

.0 — .9 MC

20 — MIKE AUDIO

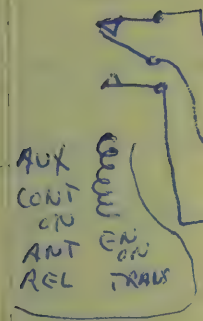
26 — MIKE CONTROL



18 — SIDETONE

19

12 — LITES WHEN TUNING MOTOR ROTATES



13
14 — audio muting
15

27 — +24V

16 — 26V TRANS

17 — 13V TR FIL NC 24V

A2 — 24V — NC on 13V

A1 — 13V+ — NC on 24V

1 — GND

119.5
7, 8 } cont
9, 10, 11 } gnd
6, 3 } gnd
4, 5 } cont

126.7
7, 9 } gnd
8, 10 } cont
3, 6 } cont
4, 5 } gnd

TABLE OF CONTENTS

Paragraph *Page*

SECTION I—DESCRIPTION

1–1. General 1–1
1–2. Specifications 1–1
1–3. Tube Complement 1–2
1–4. Frequency Control Circuits 1–2
1–5. Transmitter Circuits 1–3
1–6. Power Supply 1–4

SECTION II—INSTALLATION

2–1. General 2–1
2–2. Pre-Installation Bench Check 2–1
2–3. Microphone Adjustment 2–1
2–4. Sidetone Adjustment 2–1
2–5. Modification for 360-Channel Operation 2–1

SECTION III—MAINTENANCE

3–1. General 3–1
3–2. Alignment Procedure 3–1
3–3. Cleaning the Gear Drive Assembly 3–5
3–4. Lubrication 3–5
3–5. Removal of Frequency Generating Chassis 3–5
3–6. Removing the R-F Head 3–7
3–7. Replacing the Gang Capacitor 3–8
3–8. Removal of Dynamotor 3–8
3–9. Disassembling the Friction Clutches 3–8
3–10. Torque Adjustment of the Friction Clutches 3–9
3–11. Continuity Check of the Four-Wire Frequency Control Circuits 3–12

SECTION IV—PARTS LIST

LIST OF ILLUSTRATIONS

Figure		*Page*
1–1	Type TA–18BB Transmitter, Front View	1–1
1–2	Type TA–18BB Transmitter, Block Diagram	1–3
2–1	Installation Outline Diagram	2–2
2–2	Crystal Board with Cover Removed	2–3
2–3	Interconnection Diagram of Control System for 180-Channel Operation.	2–4
2–4	Interconnection Diagram of Control System for 360-Channel Operation.	2–5
3–1	Test Circuits for Alignment of Oscillator Bandpass Circuits	3–0
3–2	Type TA–18BB Transmitter, Top View	3–2
3–3	Type TA–18BB Transmitter, Bottom View	3–4
3–4	Location of R-F Head Mounting Screws	3–6
3–5	R-F Head with Cover Removed, Bottom View	3–7
3–6	Tuning Capacitor Assembly	3–8
3–7	Gear Access Hole on Side of Transmitter	3–9
3–8	Relay Operated Friction Clutch, Exploded View	3–10
3–9	Type MS–309A Friction Clutch Torque Adjusting Kit	3–11
4–1	Type TA–18BB Transmitter, Schematic Diagram	4–9

LIST OF TABLES

Table No.		*Page*
2–1	Typical Test Meter Readings	2–1
3–1	Typical Tube Socket Voltage Measurements	3–12
3–2	Continuity Check of Frequency Control Circuits	3–13

SECTION I
DESCRIPTION

1–1. GENERAL.

The design of the Type TA–18BB Transmitter makes it a very versatile type of aircraft equipment. It is a compact, ruggedly constructed VHF transmitter capable of covering frequencies from 118.0 megacycles to 135.95 megacycles. The unit is designed to cover the specified band of frequencies in 50-kilocycle steps by means of a crystal saver switching system. Such a system requires only 38 crystals to produce 360 crystal-controlled VHF channels with frequency stability that will not exceed 0.005 per cent from the specified channel after a suitable warm-up period. However, due to present frequency allocations, the unit is shipped from the factory to operate on 180 channels with 100-kilocycle spacing. The change from 180 channels to 360 channels is accomplished by eliminating one jumper wire from an internal disconnect plug and inserting ten more quartz crystals in the frequency generating sub chassis within the transmitter. Instructions for the change-over are given in Section II Installation. Channel selection may be accomplished by one of various control boxes, depending upon the requirements of the installation. Further information concerning these control systems will be supplied upon request. This compact transmitter is capable of delivering a nominal radio-frequency output of 35 watts into a 52-ohm resistive load, on any channel within the 118.0 to 135.95 megacycle range.

1–2. SPECIFICATIONS.

a. POWER OUTPUT.—The nominal r-f power delivered into a 52-ohm non-inductive load through a 10-foot length of 52-ohm coaxial cable is 35 watts.

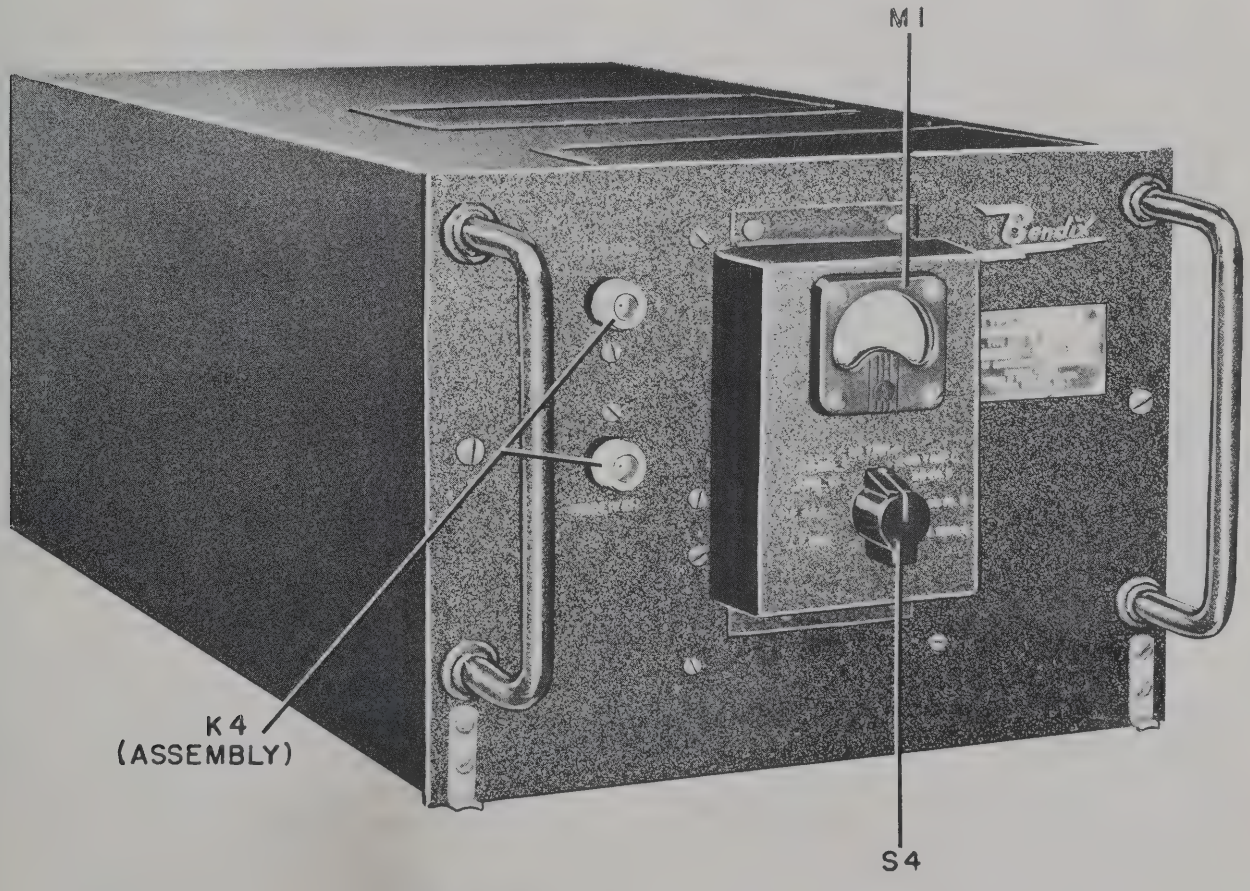


Figure 1–1. Type TA–18BB Transmitter, Front View

b. MODULATION.—Amplitude modulation is employed in this transmitter with characteristics which are substantially linear between 10 per cent and 90 per cent modulation.

c. FREQUENCY STABILITY.—Variation from the specified channel frequency will not exceed 0.005 per cent of the output frequency after a suitable warm-up period.

d. CARRIER WAVE PURITY.—All spurious radiations are attenuated at least 60 db below the carrier level.

e. HARMONIC DISTORTION.—Design is such that harmonic distortion is below 10 per cent, even at 90 per cent modulation.

f. AUDIO FIDELITY.—The over-all audio frequency characteristics of the transmitter do not vary more than 6 db between 350 and 3600 cps. Frequencies below 135 cps and above 10,000 cps are attenuated a minimum of 12 db below a 1000-cps reference value.

g. FREQUENCY RANGE.—118.0 to 135.95 megacycles, inclusive.

h. SIDETONE.—A potentiometer-type gain control is used to vary the output of the sidetone from zero to 100 milliwatts into a 300-ohm load.

i. ANTENNA.—The equipment is designed to operate satisfactorily when the output is connected through standard 52-ohm coaxial cable up to 100 feet in length to an antenna having an impedance matched to the cable with a voltage standing wave ratio not exceeding 2:1.

j. CHANNEL SET-UP TIME.—Three seconds maximum.

k. PERFORMANCE AT REDUCED BAROMETRIC PRESSURE.—The transmitter will operate within the limits of the design specifications at barometric pressures corresponding to an altitude of 31,000 feet.

l. WARM-UP PERIOD.—The time required to heat the filaments of the transmitter tubes to their proper operating temperature is approximately 75 seconds.

m. METERING FACILITIES.—A meter and its associated switch is built into the front panel of the transmitter to facilitate the checking of operating currents in the following circuits:

LF Oscillator Grid	Tripler Grid
HF Oscillator Grid	Tripler Cathode
Doubler Grid	P.A. Grid
Doubler Cathode	P.A. Cathode

Modulator Cathode

n. CAA APPROVAL.—Certificate No. 1R3–9.

o. POWER REQUIREMENTS.—27.5 volts dc at maximum current drain of 17.5 amperes.

1–3. TUBE COMPLEMENT.

Tube	*Type*	*Function*
V1	VR150	Voltage regulator
V101	5654	Push-pull mixer
V102	5654	
V103	5654	High frequency oscillator
V104	5654	Low frequency oscillator
V201	5654	Amplifier
V202	2E26	Doubler
V203	829B	Tripler
V204	829B	Power amplifier
V301	2E26	Speech amplifier
V302	2E26	Push-pull modulator
V303	2E26	

1–4. FREQUENCY CONTROL CIRCUITS.

The frequency-selecting system employed in Type TA–18BB Transmitter is known as the "open seeking" re-entrant arrangement. It includes a small permanent magnet drive motor (B1), two sets of wafer switches, two friction clutches with detents and two rack and pinion gears which rotate the tuning capacitors in the r-f section. Two relay-operated friction clutches (K1 and K2) are used to control the rotation of the two crystal selector wafer switches, either simultaneously or independently of one another, during channel selection. Each clutch plate has on its periphery, a series of detent slots corresponding in number to the number of crystals used in the respective oscillator circuits. Located immediately above the detent slots is a pawl or brake pin which is raised or lowered into the slots by movement of the armature. The construction of the armature also permits it to operate two pairs of switch contacts. One pair of contacts, wired in parallel, is used to apply power to the drive motor, while the other pair, wired in series, opens the microphone push-to-talk circuit during channel setup. The control supply bus for each frequency selecting switch in the remote control box is handed by a standard four-wire system.

The chain of reactions that is set off by the selection of a different channel at the control panel is as follows: A ground return is applied to the control supply bus by the new positioning of the frequency-selector switch permitting current to flow through the four-wire system. This flow of current energizes either one or both of the relays (K1 and K2) depending upon the frequency which is selected. The energized relays simultaneously remove the pawl from

the detent, slot, close the switch contacts that supply current to the drive motor and disable the microphone circuit. This permits the motor to run and drive the clutch detent plate from which the pawl or brake pin has been removed. The clutch shaft, thereby, rotates the crystal selector switches and pinion gears, tuning the r-f circuits to correspond with the newly-chosen frequency. When the wafers of the switches within the transmitter align themselves with the wafers in the frequency selection box, the tuning procedure ceases because the mechanical construction and alignment of the wafers will, at this position, open the control supply bus. This condition de-energizes the relay permitting the armature to drop the pawl into the clutch detent, open the motor switch contacts, and energize the microphone circuit, placing the transmitter in a usable condition on the selected channel. However, it must be kept in mind that, since the two clutches function independently of each other, both of them must be in their correct positions before the tuning mechanism completes its cycle. This entire operation is performed in less than three seconds.

1–5. TRANSMITTER CIRCUITS.

The crystal-controlled output of the Type TA–18BB Transmitter is uniquely derived by the use of a Bendix-designed frequency-mixing circuit. Two separate crystal-controlled oscillators—versions of the Pierce circuit—feed their output through bandpass circuits into the grids of the balanced mixer tubes V101 and V102. The frequency of the low frequency oscillator V103 is controlled by the 3.7666- to 3.9250-megacycle crystals each of which operates on its fundamental frequency. Tube V104 is the high frequency oscillator controlled by the 15.9- to 18.733-megacycle, third-mode crystals. The mixers, two type 5654's, working essentially as square-law detectors in push-pull, combine the two oscillator frequencies and apply the sum frequency by means of link-coupling to an amplifier. With both the grid and plate of this amplifier tunable by the ganged capacitor, maximum gain is realized throughout the entire band of frequencies. The amplified signal is capacitively-coupled through C204 to doubler tube V202 and, from there, the signal is link-coupled into the tripler tube V203. This frequency multiplication produces a power amplifier output frequency which is six times the sum frequencies of the two selected crystals. All of these stages, including the plate circuit of the push-pull mixers, are step-tuned by a ganged capacitor driven by drive motor B1. Step-tuning is made possible by the broad-banded design of the various tuned circuits. There are 18 mechanically-tuned positions to which the ganged capacitor comes to rest. The actual frequency at these positions is half-way between each whole-megacycle throughout the transmitter's tuning range; that is, 118.5 megacycles, 119.5 megacycles, 120.5 megacycles, etc. This means that the various stages have been loaded sufficiently to make them as broad as one megacycle; that is, ± 0.5 megacycle each side of the mechanically-tuned position.

The modulator section comprises a type 2E26 tube used as a speech amplifier, two type 2E26's as push-pull modulators, and a VR150 voltage regulator. Audio is applied through input transformer T302 to the grid of speech amplifier tube V301. The amplitude of this signal which is coming directly from the microphone is controlled by resistor R303. Driver transformer T303 couples this output to the push-pull modulator tubes V302 and V303. These tubes are operating as class AB_2 modulators. In order to insure

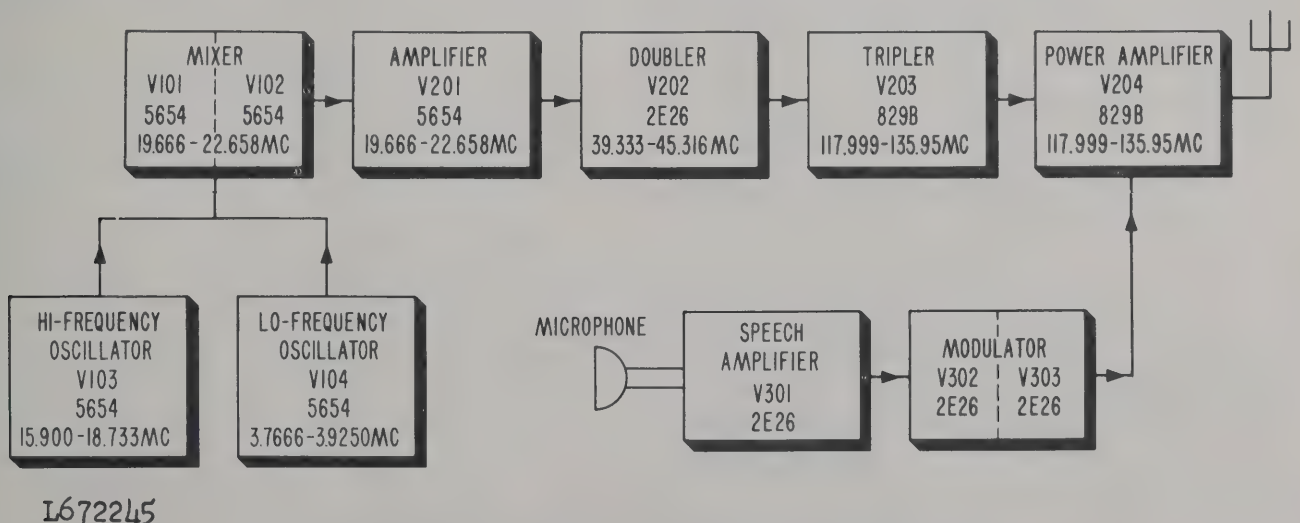


Figure 1–2. Type TA–18BB Transmitter, Block Diagram

stability, a regulated source supplies their screen voltage. The secondary of the modulation transformer consists of three windings. Two of these windings supply signal for screen and plate modulation of the power amplifier, while the other furnishes sidetone. Potentiometer R311 is connected across the winding for adjusting the sidetone level.

1–6. POWER SUPPLY.

The Type TA–18BB Transmitter utilizes a 27.5-volt dynamotor to furnish B+ potentials to the plates and screens of its vacuum tubes. The dynamotor is conventional in design having the low and high voltage output windings in series. The combined power consumption of the dynamotor, tube filaments, and control circuits creates a current drain, on the 27.5-volt d-c supply, of 17.5 amperes, maximum. Sufficient filtering is arranged in the power supply to reduce the noise level to at least 40 db below the 95 per cent modulation level.

SECTION II
INSTALLATION

2–1. GENERAL.

The Type TA–18BB Transmitter is shipped from the factory complete with tubes, dynamotor, and 28 crystals. All of the circuits are pre-tuned; hence, they require no further adjustment upon installation. The unit, as received, will give many hours of satisfactory operation when properly mounted on a Type MT–117B Mounting Base. For installation dimensions, refer to figure 2–1.

2–2. PRE-INSTALLATION BENCH CHECK.

In order to complete this check, the following equipment is required:

Bendix Type MS–308A frequency selector or equivalent for 50 kc operation.

Bendix Type MT–139A frequency selector or equivalent for 100 kc operation.

On-off toggle switch.

Carbon microphone with push-to-talk switch.

Bird Termaline Wattmeter, Model 67, or equivalent. Proceed as follows:

Connect the equipment listed above, as shown in figure 2–3.

Turn on the equipment and allow it to reach normal operating temperature.

Rotate the front panel meter switch to each labeled position and check meter readings with those given in table 2–1.

TABLE 2–1. TYPICAL TEST METER READINGS

Switch Position	*Approximate Reading*
Low frequency oscillator grid current	0.75 ma
High frequency oscillator grid current	0.4 ma
Doubler grid current	1.25 ma
Doubler cathode current	55 ma
Tripler grid current	8 ma
Tripler cathode current	115 ma
P.A. grid current	14 ma
P.A. cathode current	225 ma
Modulator cathode current	175 ma at 95 per cent modulation

Note

If the meter readings correspond to the one listed above the transmitter power output should be approximately 35 watts.

2–3. MICROPHONE ADJUSTMENT.

a. Check to make sure that the power amplifier is loaded to approximately 225 milliamperes of cathode current.

b. Turn the meter switch to the modulator cathode current position.

c. Adjust microphone gain control R303 (see figure 3–2) for a reading of 175 milliamperes *on peaks,* while speaking into the microphone in a normal voice. This control provides a range of approximately 12 db.

2–4. SIDETONE ADJUSTMENT.

While modulating the transmitter, adjust sidetone volume control R311 (see figure 3–2) to the desired level. This system delivers approximately 100 milliwatts into a 300-ohm load.

2–5. MODIFICATION FOR 360–CHANNEL OPERATION.

a. Disengage disconnect plug P1 (see figure 3–3).

b. Remove the jumper connected between terminals 26 and 27, on plug P1.

c. Re-insert the disconnect plug P1 into J1.

d. Remove crystal cover and insert ten low frequency crystals. The frequencies and positions of the ten additional crystals are listed on the schematic diagram (figure 4–1).

e. See figure 2–4 for correct interconnection of the remote control system.

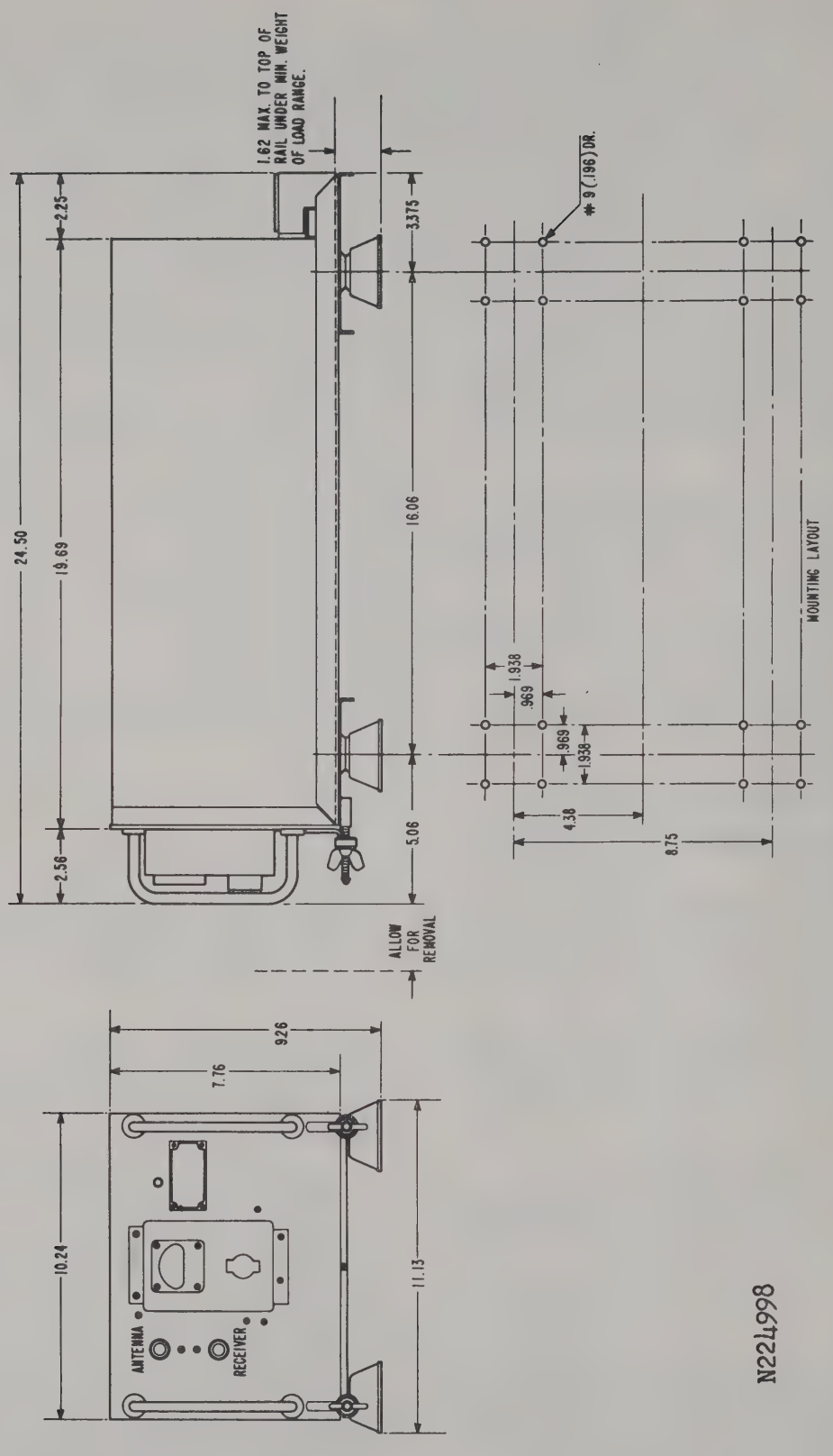


Figure 2–1. Installation Outline Diagram

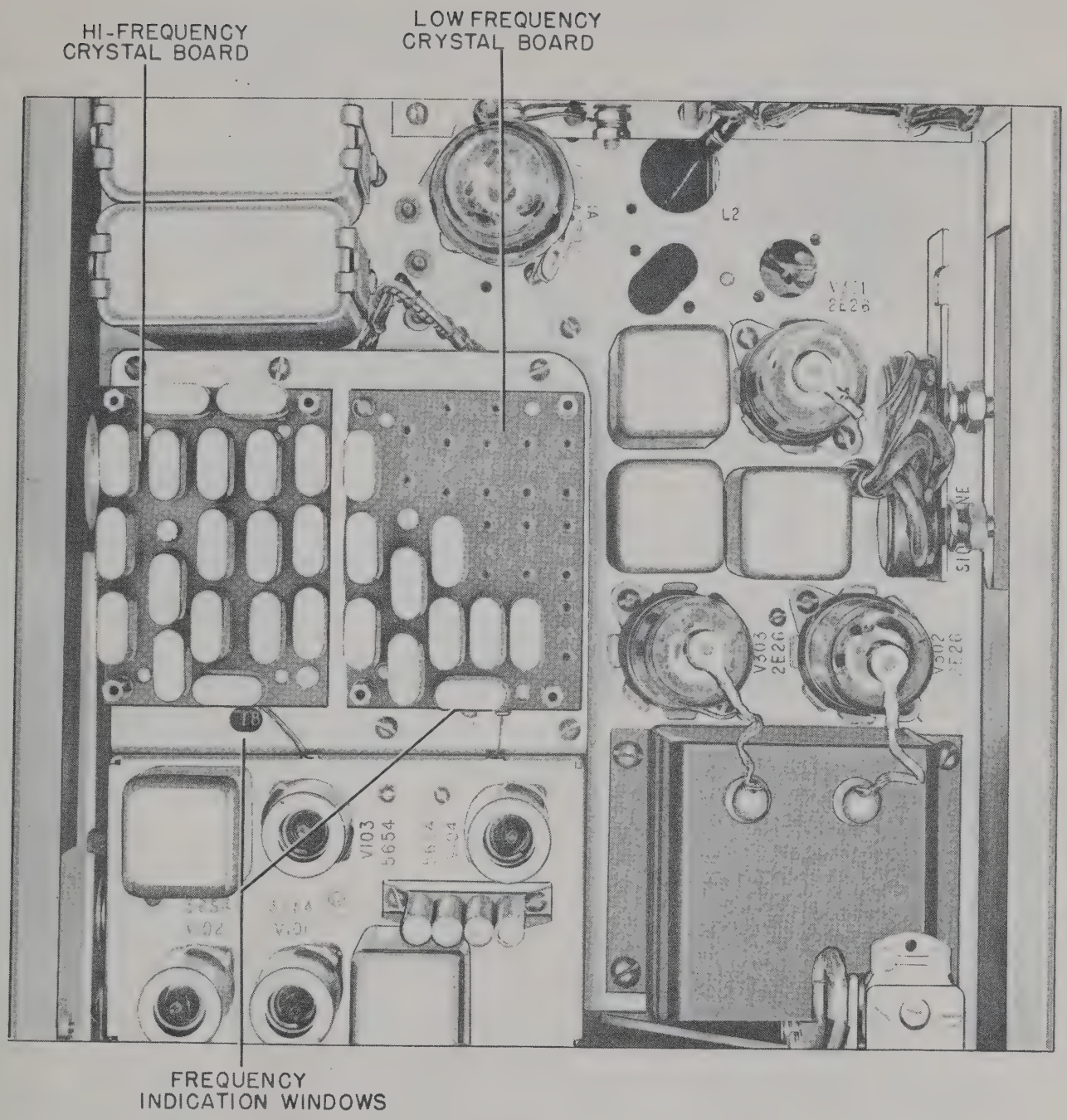


Figure 2–2. Crystal Boards with Cover Removed

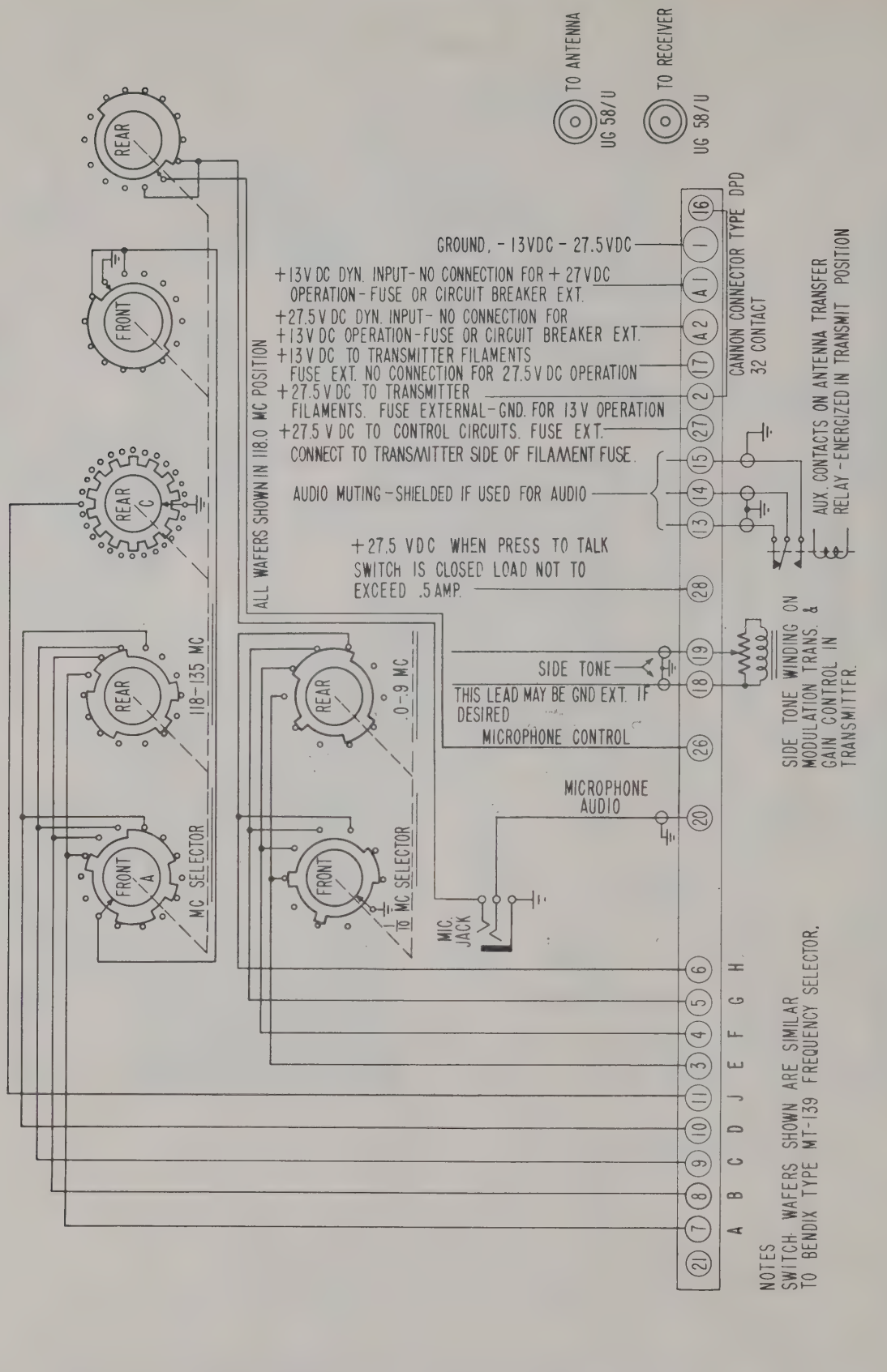

TO ANTENNA UG 58/U
TO RECEIVER UG 58/U
REAR
FRONT
REAR C
REAR A
FRONT A
REAR
FRONT
ALL WAFERS SHOWN IN 118.0 MC POSITION
118-135 MC
MC SELECTOR
.0-.9 MC
TO MC SELECTOR
MIC. JACK
GROUND, -13VDC - 27.5VDC
+13V DC DYN. INPUT- NO CONNECTION FOR + 27VDC OPERATION- FUSE OR CIRCUIT BREAKER EXT.
+27.5V DC DYN. INPUT- NO CONNECTION FOR +13V DC OPERATION-FUSE OR CIRCUIT BREAKER EXT.
+13V DC TO TRANSMITTER FILAMENTS FUSE EXT. NO CONNECTION FOR 27.5V DC OPERATION
+27.5V DC TO TRANSMITTER FILAMENTS. FUSE EXTERNAL-GND. FOR 13V OPERATION
+27.5 V DC TO CONTROL CIRCUITS. FUSE EXT. CONNECT TO TRANSMITTER SIDE OF FILAMENT FUSE.
AUDIO MUTING-SHIELDED IF USED FOR AUDIO
+27.5 VDC WHEN PRESS TO TALK SWITCH IS CLOSED LOAD NOT TO EXCEED .5 AMP.
SIDE TONE
THIS LEAD MAY BE GND EXT. IF DESIRED
MICROPHONE CONTROL
MICROPHONE AUDIO
CANNON CONNECTOR TYPE DPD 32 CONTACT
AUX. CONTACTS ON ANTENNA TRANSFER RELAY - ENERGIZED IN TRANSMIT POSITION
SIDE TONE WINDING ON MODULATION TRANS. & GAIN CONTROL IN TRANSMITTER.
A B C D J E F G H
NOTES
SWITCH WAFERS SHOWN ARE SIMILAR TO BENDIX TYPE MT-139 FREQUENCY SELECTOR.
N247809

Figure 2–3. Interconnection Diagram of Control System for 180 Channel Operation

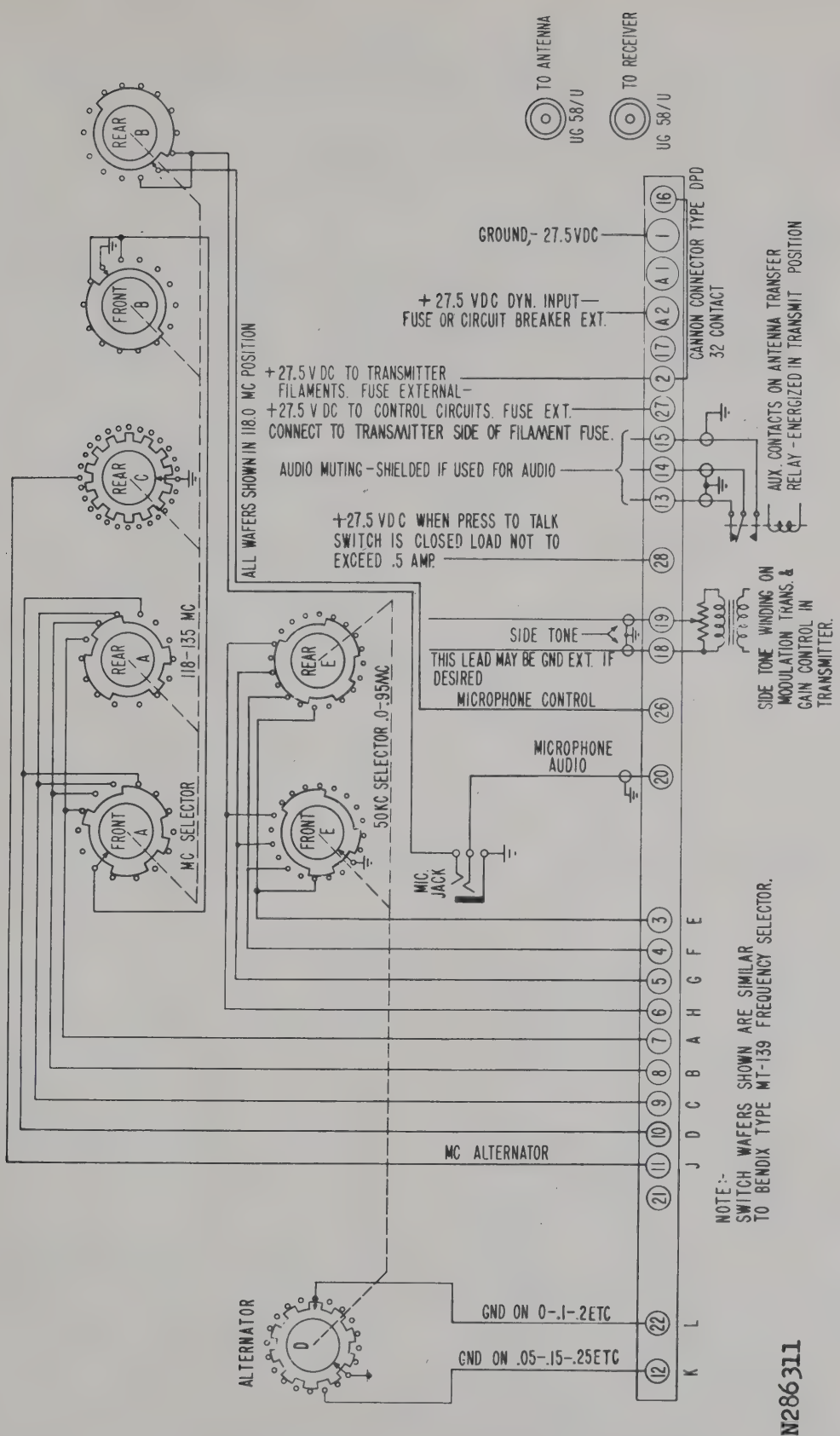
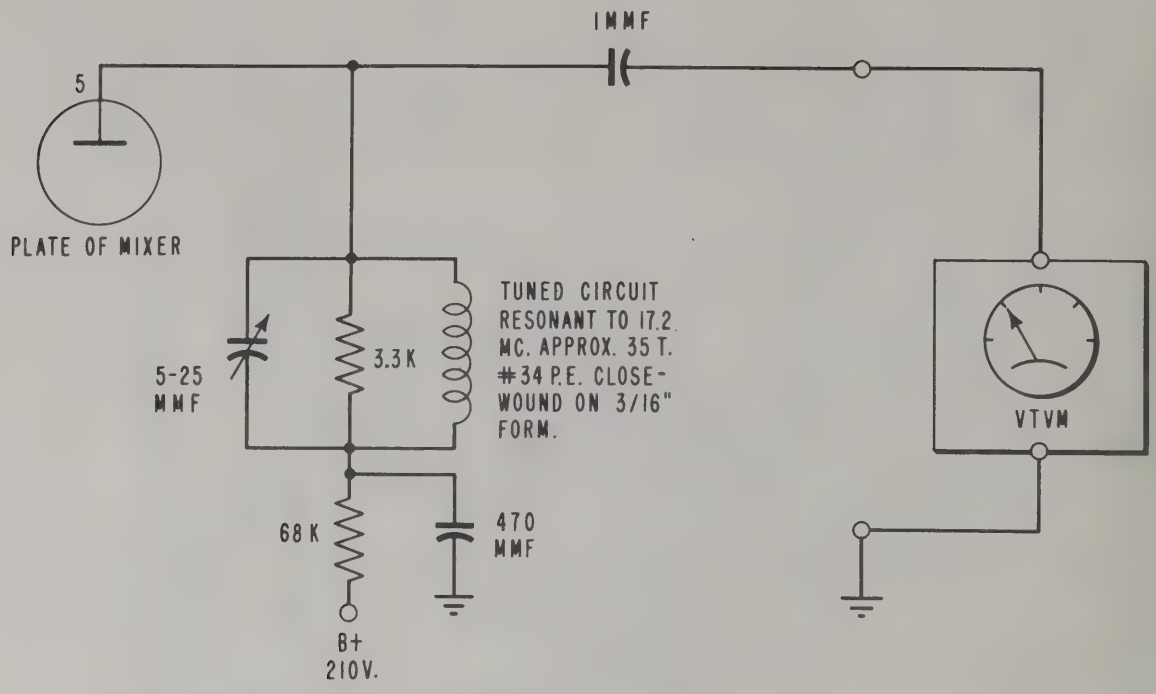
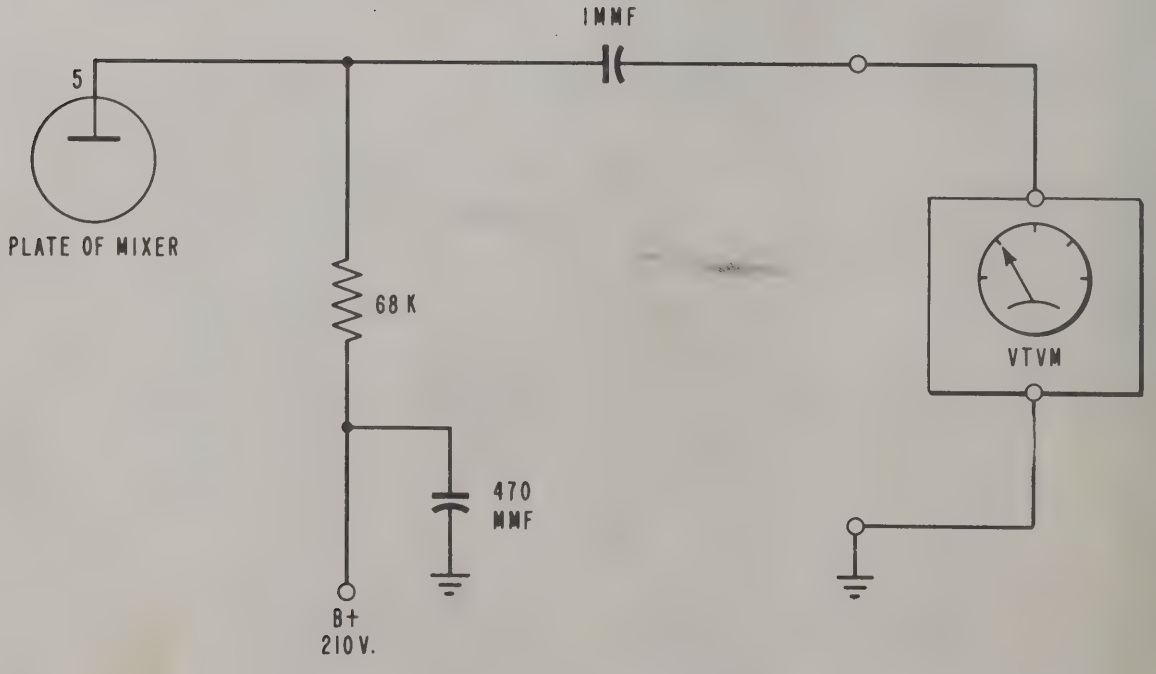

TO ANTENNA UG 58/U
TO RECEIVER UG 58/U
REAR B
FRONT B
REAR C
REAR A
FRONT A
REAR E
FRONT E
ALL WAFERS SHOWN IN 118.0 MC POSITION
118-135 MC
MC SELECTOR
50 KC SELECTOR .0-.95MC
MIC. JACK
GROUND,- 27.5VDC
+27.5 VDC DYN. INPUT— FUSE OR CIRCUIT BREAKER EXT.
+27.5 V DC TO TRANSMITTER FILAMENTS. FUSE EXTERNAL-
+27.5 V DC TO CONTROL CIRCUITS. FUSE EXT.
CONNECT TO TRANSMITTER SIDE OF FILAMENT FUSE.
AUDIO MUTING - SHIELDED IF USED FOR AUDIO
+27.5 VDC WHEN PRESS TO TALK SWITCH IS CLOSED LOAD NOT TO EXCEED .5 AMP.
SIDE TONE
THIS LEAD MAY BE GND EXT. IF DESIRED
MICROPHONE CONTROL
MICROPHONE AUDIO
MC ALTERNATOR
GND ON 0-.1-.2ETC
GND ON .05-.15-.25ETC
ALTERNATOR
CANNON CONNECTOR TYPE DPD 32 CONTACT
AUX. CONTACTS ON ANTENNA TRANSFER RELAY - ENERGIZED IN TRANSMIT POSITION
SIDE TONE WINDING ON MODULATION TRANS. & GAIN CONTROL IN TRANSMITTER.
NOTE:- SWITCH WAFERS SHOWN ARE SIMILAR TO BENDIX TYPE MT-139 FREQUENCY SELECTOR.
N286311

Figure 2–4. Interconnection Diagram of Control System for 360 Channel Operation



(A) H.F. TEST CIRCUIT



L292782

(B) L.F. TEST CIRCUIT

Figure 3–1. Test Circuits for Alignment of Oscillator Bandpass Circuits

SECTION III
MAINTENANCE

3–1. GENERAL.

The Type TA–18BB Transmitter, with its rugged construction, will remain properly aligned through long periods of normal operation. The broad-band tuning employed permits small variations to take place without seriously affecting the power output. Normally, the changing of tubes will not alter the circuits sufficiently to require realignment. However, if a new tube made by a different manufacturer is placed in either the tripler or power amplifier stages, the detuning effect caused by input and output capacity variations might be sufficient to warrant capacment of the affected stage. In trouble-shooting the unit, it is not recommended that the oscillators or mixer stages be disturbed unless it is definitely established that the difficulty lies within this part of the transmitter.

The instructions that follow include information for complete alignment of the transmitter circuits. It is always best to refer to the meter readings given in the installation section for accurate location of the faulty circuit.

3–2. ALIGNMENT PROCEDURE.

a. EQUIPMENT REQUIRED.—The following equipment and components are required for complete alignment of the TA–18BB Transmitter.

(1) Measurements Corporation Model 59 Megacycle Meter or equivalent.

(2) Vacuum tube voltmeter with high frequency probe.

(3) Five 1/2-watt resistors: 100 ohms, 180 ohms, 150 ohms, 3300 ohms, and 68,000 ohms.

(4) Two capacitors: 1 micromicrofarad and 470 micromicrofarad.

(5) A small tank circuit fabricated from a miniature variable capacitor of 25 micromicrofarad and a small coil (35 turns of No. 34 plain enamel wire wound within a 1/4-inch space on a 3/16-inch form).

b. LOW FREQUENCY BANDPASS CIRCUIT (T102).

(1) Set transmitter on 127.4 megacycles.

(2) Remove the frequency-generating chassis from the transmitter by taking out the mounting screws and unsoldering the two mixer plate leads.

(3) Connect vacuum tube voltmeter, 68,000-ohm resistor, 470-micromicrofarad capacitor and 1-micromicrofarad capacitor, as shown in B of figure 3–1.

(4) Remove crystal Y–120 (17.400 megacycles) to disable the high frequency oscillator.

(5) Place the 1500-ohm resistor across secondary of T102 to uncouple windings.

(6) Turn on set and tune capacitor C106 (primary) for maximum reading on VTVM.

(7) Move the 1500-ohm resistor from the secondary to the primary of T102 and tune capacitor C109 (secondary) for maximum reading on VTVM.

(8) Disconnect test circuit and replace crystal Y–120.

c. HIGH FREQUENCY BANDPASS CIRCUIT (T101).

(1) Connect high frequency test circuit as indicated in A of figure 3–1.

(2) Remove crystal Y–105 (3.8333 megacycles).

(3) Place the 180-ohm resistor across secondary of T101 (green leads).

(4) Turn the power on and adjust the variable capacitor in the test circuit for maximum voltage indication on the VTVM.

(5) Tune Capacitor C117 for maximum reading on VTVM.

(6) Move the 180-ohm resistor from the secondary to the primary of T101, and adjust capacitor C120 for maximum reading on the VTVM.

(7) Disconnect test circuit and replace crystal Y–105.

(8) Remove the 180-ohm resistor from T101. Reassemble the frequency-generating chassis and install it in the transmitter.

d. MIXER PLATE AND AMPLIFIER GRID CIRCUITS.

(1) Disconnect the plate voltage to the transmitter.

(2) Remove the bottom shield and connect a 100-ohm resistor across inductor L211.

(3) Turn the frequency selector to 135.5 megacycles.

(4) Set capacitor C124 to approximately 1/2 maximum capacity.

(5) Tune the Megacycle Meter to 22.583 megacycles and hold it near inductor L107. At the same time,

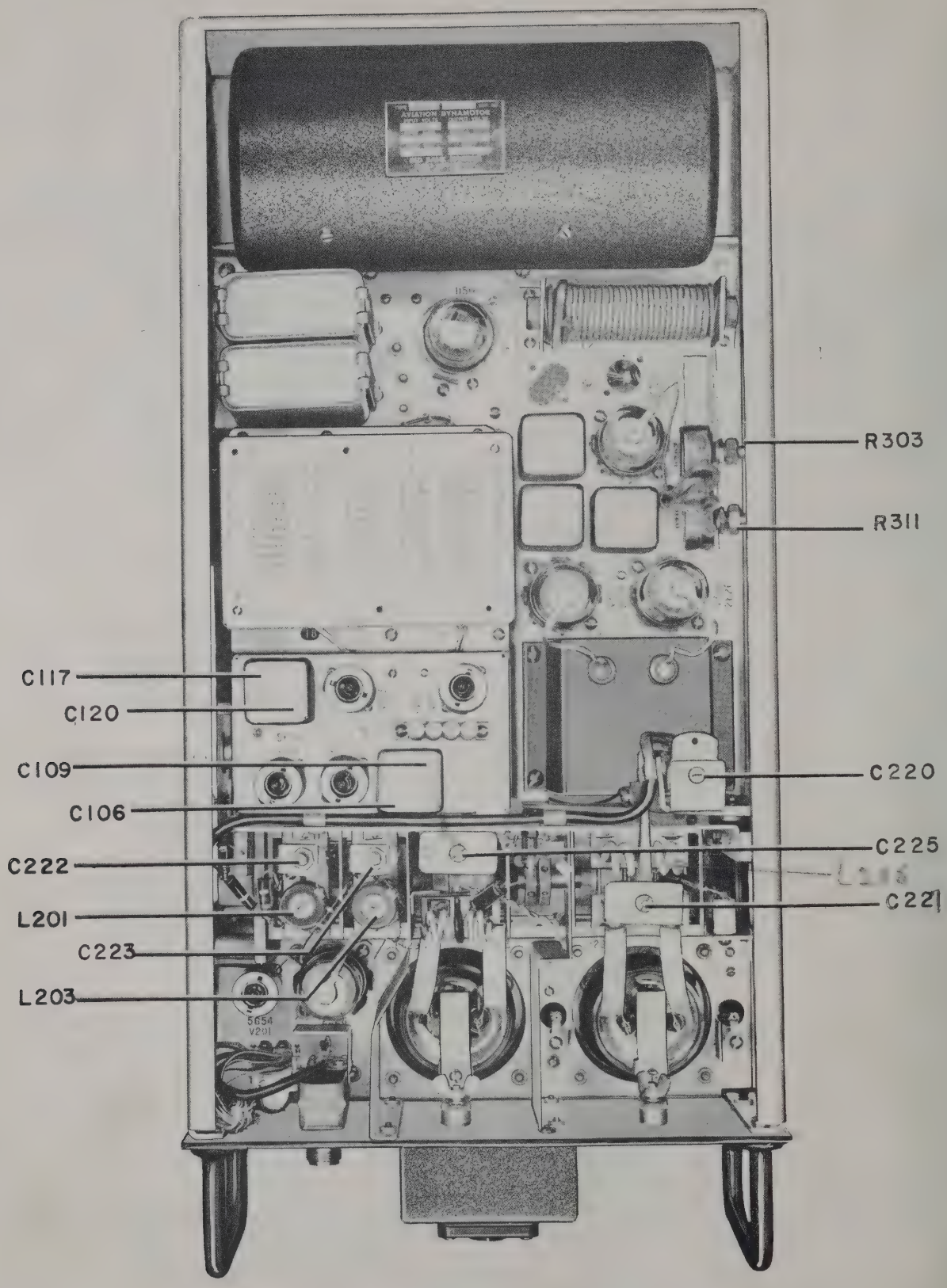


Figure 3–2. Type TA–18BB Transmitter, Top View

adjust the slugs of inductor L107 for resonance. Keep the slugs equal distance from each end of the coil.

(6) Turn the frequency selector to 118.5 megacycles. Tune the Megacycle Meter to 19.750 megacycles.

(7) Check for resonance at this end of the band. If the circuit does not track, use a new setting of capacitor C124 and repeat steps (3) through (6).

(8) Move the 100-ohm resistor from across inductor L211 and connect it across inductor L107.

(9) Turn the frequency selector to 135.5 megacycles. Tune the Megacycle Meter to 22.583 megacycles.

(10) With capacitor C229 set to approximately 1/2 maximum capacity, tune inductor L211 to resonance.

(11) Check for tracking as outlined in steps (6) and (7). Adjust capacitor C229 as required.

(12) Remove the 100-ohm resistor and reconnect the plate voltage to the transmitter.

e. AMPLIFIER PLATE CIRCUIT.

(1) Open P.A. screen lead on the terminal board located adjacent to modulation transformer T304.

(2) Turn meter switch S4, on the transmitter, to the doubler grid position.

(3) Select a frequency of 135.5 megacycles.

(4) Energize the transmitter by pressing the push-to-talk button on the microphone.

WARNING

High voltages are now present in the set—use an insulated screwdriver for making these adjustments.

(5) Set capacitor C222 at approximately 1/2 capacity and adjust inductor L201 for maximum current indication on meter M1.

(6) Select a frequency of 118.5 megacycles and check the amplifier plate circuit for resonance. If resonance is not obtained, switch back to 135.5 megacycles and, with a new setting of capacitor C222, readjust inductor L201 for maximum current indication. Repeat this procedure until proper tracking is realized.

f. DOUBLER PLATE CIRCUIT.

(1) Connect 100-ohm resistor across inductor L204.

(2) Turn meter switch S4 to the doubler cathode current position.

(3) Select a frequency of 135.5 megacycles and adjust capacitor C223 to approximately 1/2 capacity.

(4) With the transmitter on, tune inductor L203 for *minimum* cathode current.

(5) Select a frequency of 118.5 megacycles and check for resonance. If resonance is not obtained, switch back to 135.5 megacycles and, with a new setting of capacitor C223, readjust inductor L203 for minimum current indication. Repeat this procedure until proper tracking is realized.

(6) Remove the 100-ohm load resistor and replace the bottom shield.

g. TRIPLER GRID CIRCUIT.

(1) Turn meter switch S4 to the tripler grid current position.

(2) Select a frequency of 135.5 megacycles and with the transmitter on, tune capacitor C224 for maximum grid current. (Adjust inductor L204 by compressing or stretching the coil until capacitor C224 tunes at approximately 1/2 capacity.)

(3) Select a frequency of 118.5 megacycles and check for resonance. If resonance is not obtained, switch back to 135.5 megacycles. With a new setting of inductor L204, readjust capacitor C224 for maximum current indication. Repeat this procedure until proper tracking is realized.

h. TRIPLER PLATE CIRCUIT.

(1) Place a 100-ohm resistor across inductor L206.

(2) Remove the jumper connected across resistor R213, the tripler screen circuit.

(3) Connect a d-c voltmeter (20,000 ohms/volt) across resistor R213.

(4) Select a frequency of 135.5 megacycles and, with the transmitter on, tune capacitor C225 for maximum reading on the voltmeter. (Adjust inductor L205 by compressing or stretching the coil until capacitor C225 tunes at approximately 1/2 capacity.)

(5) Select a frequency of 118.5 megacycles and check for resonance. If resonance is not obtained, switch back to 135.5 megacycles. With a new setting of inductor L205, readjust capacitor C225 for maximum voltmeter reading. Repeat this procedure until proper tracking is realized.

(6) Disconnect the 100-ohm loading resistor, the d-c voltmeter, and replace the jumper across resistor R213.

i. POWER AMPLIFIER GRID.

(1) Turn meter switch S4 to the P.A. grid position.

(2) Select a frequency of 135.5 megacycles and, with the transmitter on, tune capacitor C226 for maximum grid current. (Adjust inductor L206 by compressing or stretching the coil until capacitor C226 tunes at approximately 1/2 capacity.)

(3) Select a frequency of 118.5 megacycles and check for resonance. If resonance is not obtained, switch back to 135.5 megacycles. With a new setting of inductor L206, readjust capacitor C226 for maxi-

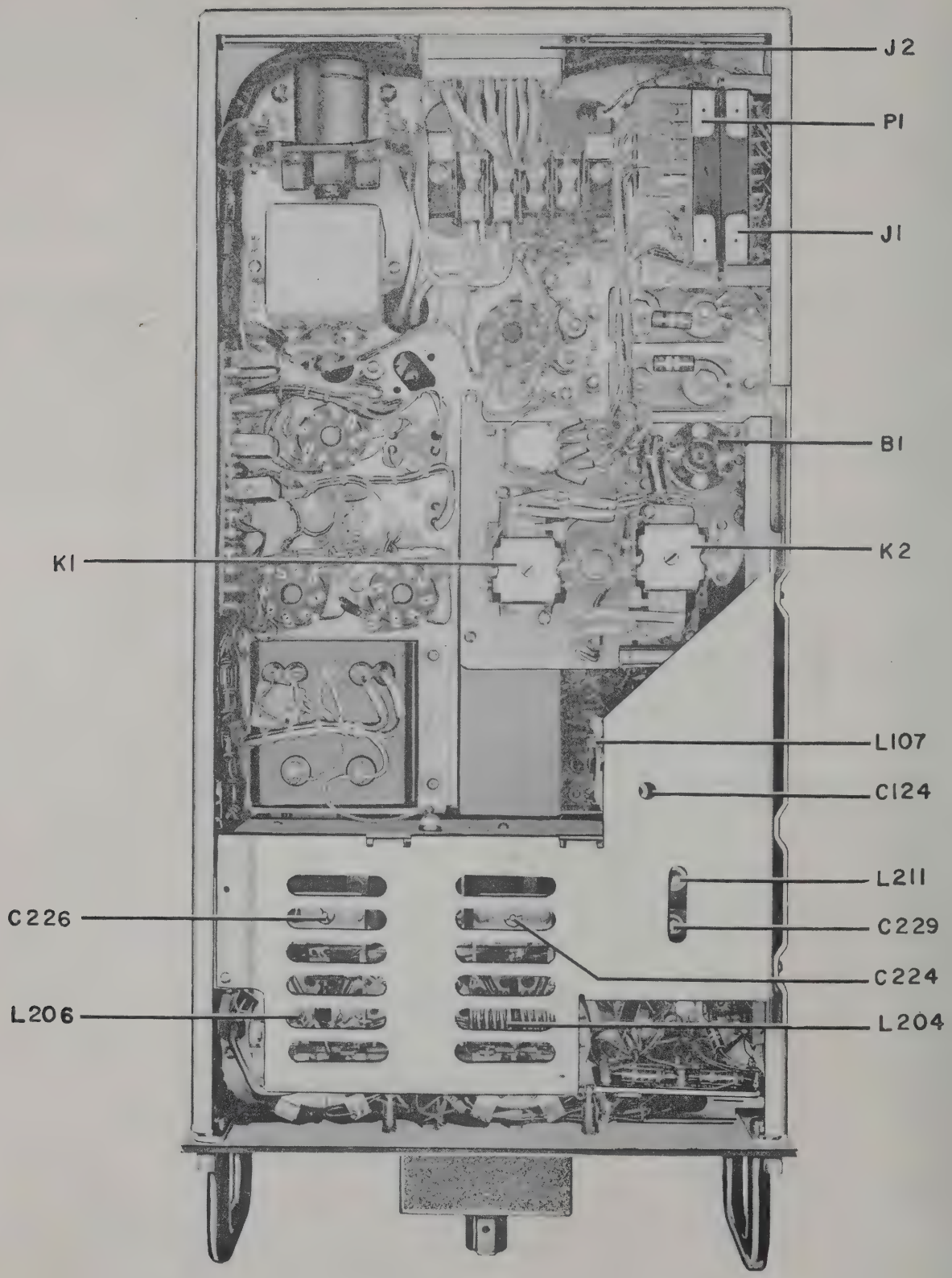


Figure 3–3. Type TA–18BB Transmitter, Bottom View

mum indication on meter M1. Repeat this procedure until proper tracking is realized.

(4) Check the meter reading at the even-megacycle-, half-megacycle-, and 0.9-megacycle-channels, for approximately 12 milliamperes minimum.

j. POWER AMPLIFIER PLATE CIRCUIT.

(1) Connect the P.A. screen lead.

(2) Disconnect the antenna and set capacitor C220 to minimum capacity.

(3) Set meter switch S4 to the P.A. cathode current position.

(4) Select a frequency of 135.5 megacycles and, with the transmitter on, tune capacitor C227 for minimum indication on meter M1. (Adjust inductor L208 by compressing or stretching the coil until capacitor C227 tunes at approximately 1/2 capacity.)

(5) Select a frequency of 118.5 megacycles and check for resonance. If resonance is not obtained, switch back to 135.5 megacycles. With a new setting of inductor L208, readjust capacitor C227 for maximum indication on meter M1. Repeat this procedure until proper tracking is realized.

(6) Connect the antenna transmission line to the front panel receptacle.

(7) Select a frequency of 127.5 megacycles and adjust capacitor C220 for maximum power output or maximum capacity. If the P.A. cathode does not reach approximately 225 milliamperes, tighten the antenna coupling of the P.A. stage.

Note

To vary loading, loosen two screws in capacitor C220 mounting bracket and slide assembly up or down in 1/8-inch steps. After correct position is determined, tracking of the P.A. plate should be rechecked.

k. NEUTRALIZATION OF THE POWER AMPLIFIER.—The setting of the neutralizing tabs is not critical for correct operation of the transmitter; however, there is an optimum setting for any one tube. To obtain this setting proceed as follows:

(1) Connect a 250-megacycle d-c meter across R226. (This resistor is accessible through the access hole in the side of the chassis.)

(2) Disconnect the antenna and set C220 to the minimum capacity position.

(3) Loosen the screws at the bottom of the grid lead stand-offs.

(4) Turn the meter switch S4, on the transmitter, to the P.A. grid position.

(5) Select a frequency of 135.5 megacycles and energize the transmitter.

(6) Tune C227 through resonance (minimum reading on meter across R226) and observe the variation in P.A. grid current on M1.

(7) Adjust the neutralizing tabs in steps; move the tabs to a new position and repeat step 5 observing the P.A. grid current variation on M1. Repeat this adjustment until minimum variation in P.A. grid current is observed.

(8) Securely tighten the tabs and tune C227 for resonance.

3–3. CLEANING THE GEAR DRIVE ASSEMBLY.

a. Trim a small, coarse-bristled brush to a point. Using the brush, loosen dirt, metal fillings, and hardened grease.

b. Roll a small wad of absorbent cotton on the end of a tooth pick, secure it with a piece of Scotch tape, and swab all surfaces to pick up the loosened foreign matter.

c. Continue with procedure above, until the entire assembly is clean.

d. Lubricate as outlined under paragraph 3–4.

3–4. LUBRICATION.

a. CLUTCH ASSEMBLY.—Sparingly apply a very small amount of grease (Spec. AN–G–25) to the teeth of the gear assembly and to the edges of the slots in the detent plate. A very light film to reduce friction is all that is necessary.

Note

Do not permit any grease to get on the highly polished clutch surface of the detent plate. To do so will cause incorrect functioning of the clutch.

b. GEAR DRIVE ASSEMBLY.—Liberally apply grease (Spec. AN–G–25) to the teeth of all the gears upon completion of each scheduled cleaning.

c. DYNAMOTOR.—Bearings should be lubricated after 1000 hours of operation or at the end of six months service, whichever occurs first. Remove the bearing plates and clean off old grease. Apply sufficient grease to cover the bearings but do not pack them. Be sure to keep grease off the commutator.

3–5. REMOVAL OF FREQUENCY GENERATING CHASSIS.

a. Set the frequency to 118.0 megacycles.

b. Unsolder the two mixer plate leads. One is accessible through the bottom chassis opening, while the other can be reached through the gear access hole in the side.

c. Remove the seven mounting screws which attach the subassembly to the r-f head.

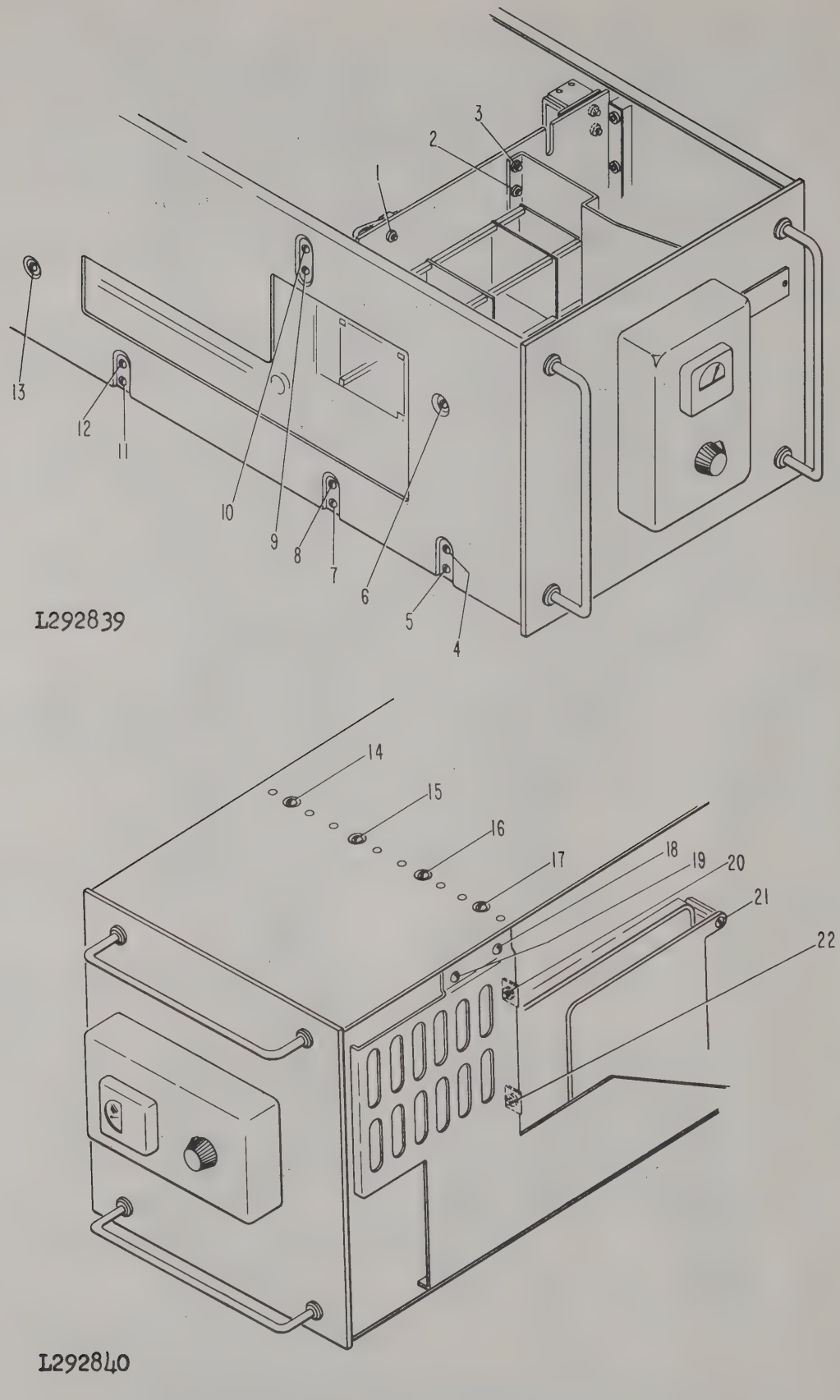


Figure 3–4. Location of R-F Head Mounting Screws

d. If the frequency-generating circuit is to be kept operating for alignment purposes, lift it out of the main chassis and lay it back on the dynamotor, placing a piece of insulating material between the two units. (A useful auxiliary test jig can be fabricated from a piece of sheet metal. Cut out an L-bracket and drill a couple of screw holes corresponding to those in the sub-chassis. Screw the bracket to the sub-chassis and clamp it to the main chassis for ease of aligning the transmitter.)

3–6. REMOVING THE R–F HEAD.

a. Set the transmitter on 118.0 megacycles.

b. Remove the mounting screws. (See figure 3–4.)

c. Unsolder the red B+ lead at the left rear of the front partition.

d. Disconnect the bus wire from inductor L201.

e. Remove the plate caps from the type 2E26 tube and the two 829B tubes.

f. Unsolder the P.A. plate r-f choke (L209) located near the rear right side of the gang capacitor assembly.

g. Remove the ground straps from the bottom of the gang capacitor.

h. Unsolder the grid connections from the two 829B tubes.

i. Disconnect the 400-volt B+ lead from the insulated terminal at the rear center of the gang capacitor assembly.

j. Unsolder resistors R204, R211, and R215.

k. Pull out disconnect plug P1. (See figure 3–3.)

l. Remove the complete r-f head through bottom of main chassis.

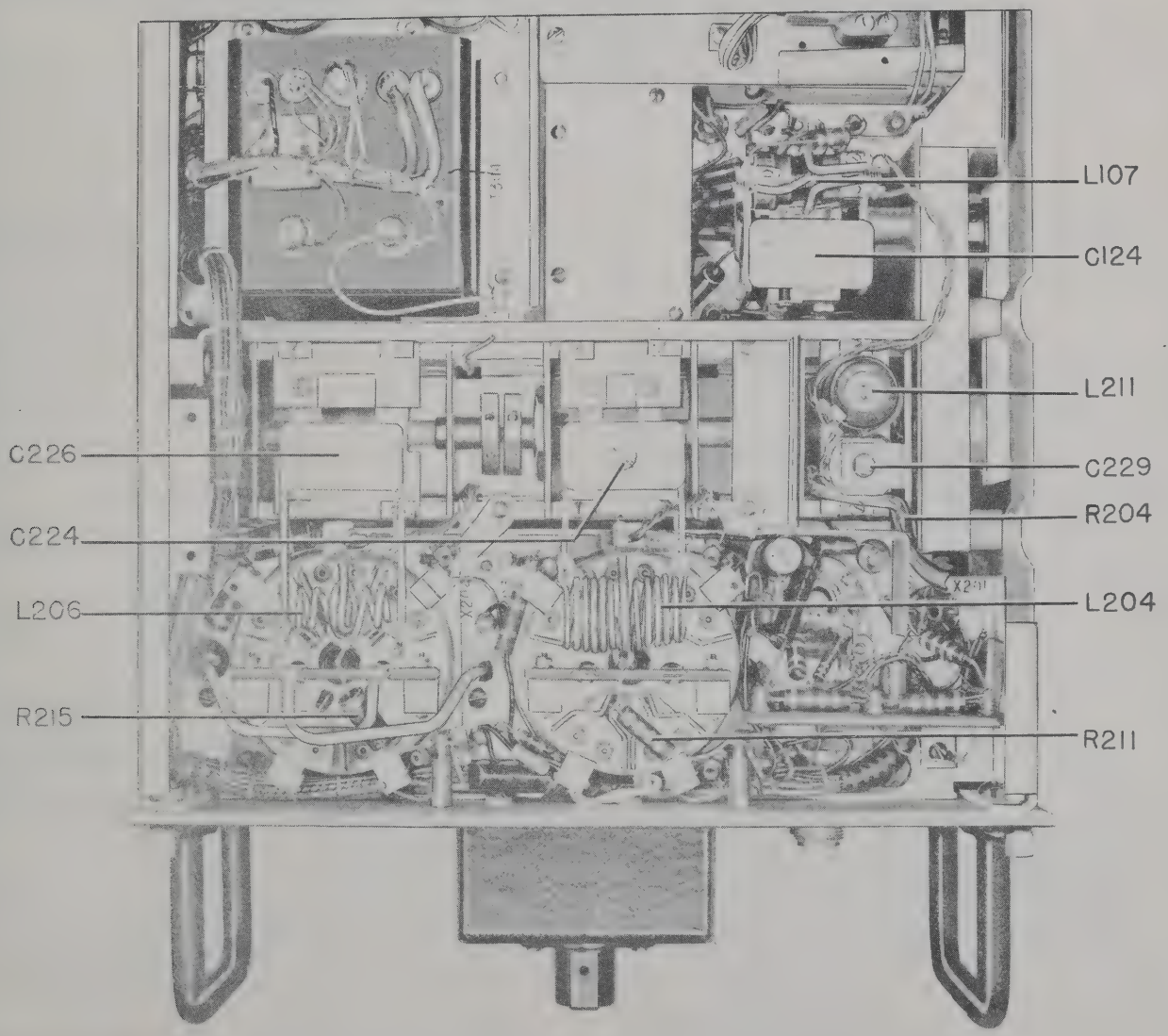


Figure 3–5. R-F Head with Cover Removed, Bottom View

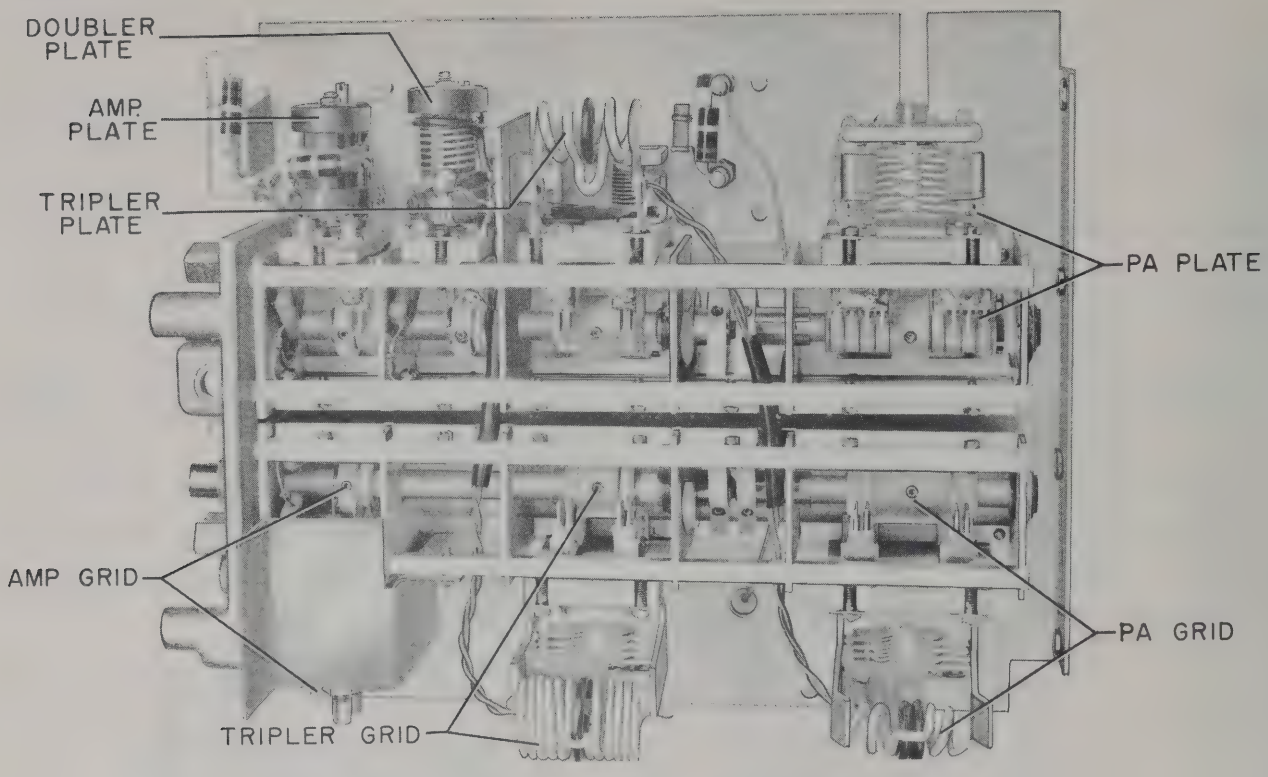


Figure 3–6. Tuning Capacitor Assembly

3–7. REPLACING THE GANG CAPACITOR.

a. Remove the r-f head as outlined in paragraph 3–6.

b. Take out the two No. 6 x 32 screws located at the shaft end and the three No. 4 x 40 screws along the rear mounting plate.

c. Unsolder the attached wires.

d. To remove the gang from the gear assembly, loosen the two setscrews in the gear.

e. Place the new gang capacitor in position and attach it with the five mounting screws.

f. Spring-load the split gear by two teeth and press it on to the capacitor shaft. *Do not tighten the setscrews.*

g. Check the rotation of the new capacitor gang, making sure that it does not bind at any position.

h. Rotate the capacitor gang to the completely meshed position, and place the small alignment pointer on the shaft on the gang being installed.

i. Set the pointer exactly on the low frequency mark in the small dial of the gang assembly. (See figure 3–6.)

j. Rotate the pointer in the direction of the arrow until it aligns exactly with the second mark on the dial. Repeat steps *i* and *j* for each gang section. This is the correct position for the setting of 118.0 megacycles.

k. Tighten the setscrews in the spring-loaded gears and reconnect all leads.

l. Replace the r-f head in the main chassis and check alignment.

3–8. REMOVAL OF DYNAMOTOR.

a. Disconnect the four leads from barrier-type terminal strip E501.

b. Remove the four mounting screws which are accessible from the top of the chassis.

c. Lift the dynamotor out through the top.

3–9. DISASSEMBLING THE FRICTION CLUTCHES.

Clutch assemblies K1 and K2 are precision devices and should be handled accordingly.

Note

When disassembling the clutch it is important to mark each part for correct positioning so that it can be reassembled correctly.

a. Clearly mark the end of shaft and hub assembly to assure identical replacement.

b. Remove the hub assembly (item 15, figure 3–8) by loosening the two setscrews.

c. Remove the two screws (items 7 and 8) and take out the small spring (item 10).

d. Separate the bottom part of the mounting assembly from the top and lift the shims from the shaft of the friction clutch and gear subassembly.

e. Remove the subassembly from its mounting and take the nut, flat washer, and spring washer off the shaft.

f. Mark the clutch plates and gear surfaces to assure identical replacement and slide them off the shaft.

g. Before reassembling the clutch and gear subassembly, clean each part thoroughly. Cleaning must be performed with a lint-free cloth moistened with Perchlorethylene. Avoid touching cleaned clutch plate surfaces. To reassemble the clutch and gear subassembly, reverse the foregoing disassembly procedure.

Note

Before inserting the clutch and gear subassembly into the mounting bracket, the torque adjustment outlined in paragraph 3–10 must be performed.

3–10. TORQUE ADJUSTMENT OF THE FRICTION CLUTCH.

The Bendix Type MS–309A Friction Clutch Torque Adjusting Kit is now available. This kit has been designed to be used with a lathe, and a small spring scale capable of measuring at least three pounds. Upon obtaining the kit proceed with the following steps:

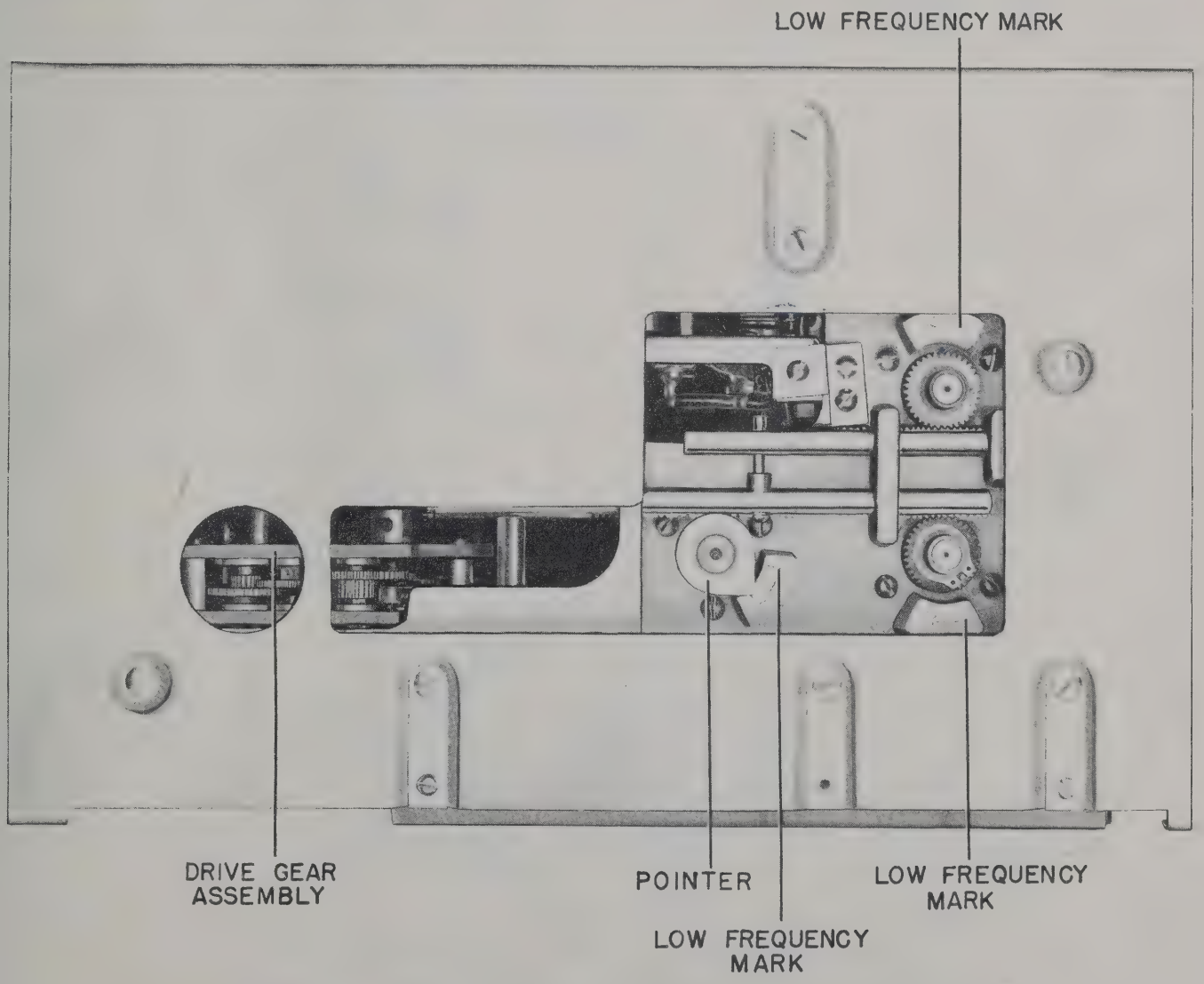


Figure 3–7. Gear Access Hole on Side of Chassis

1 Screw
2 Coil frame
3 Adjusting screw
4 Relay coil
5 Spring
6 Relay armature
7 Screw
8 Screw
9 Contact assembly
10 Armature spring
11 Upper portion of mounting assembly
12 Brake pin spring
13 Friction clutch subassembly
14 Lower portion of mounting assembly
15 Hub assembly
16 Nut
17 Flat washer
18 Spring washer
19 Flat washer (clutch plate)
20 Gear assembly
21 Detent plate
22 Shaft assembly

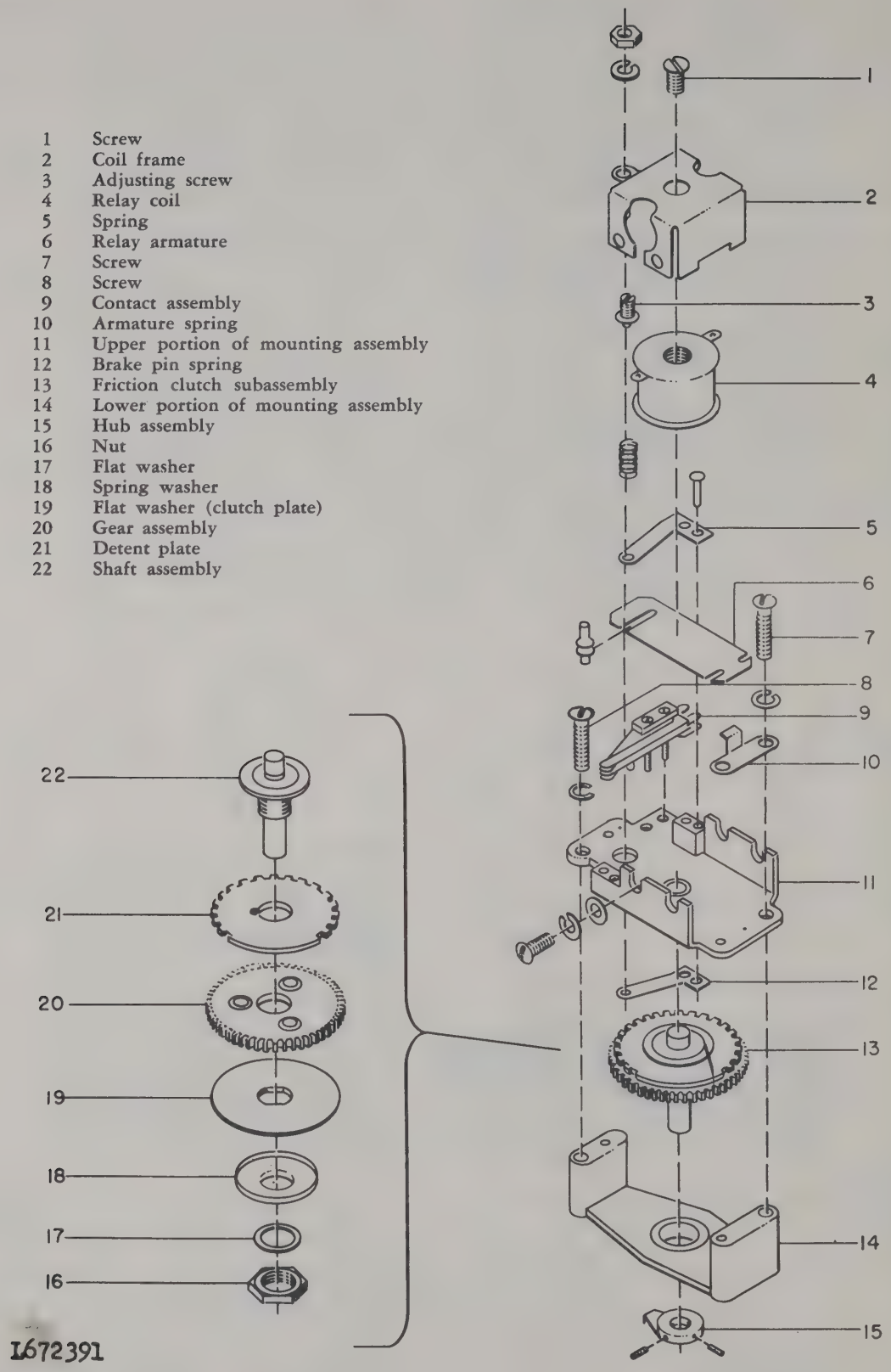


Figure 3–8. Relay Operated Friction Clutch, Exploded View

Note

It is very important that the torque on the clutches be adjusted while being rotated at 60 rpm.

a. Insert the gear of the clutch and gear subassembly into the gear-holding ring.

b. Place the opposite end of the holding ring into the chuck of the lathe and tighten the jaws sufficiently to securely hold the gear. Set up the lathe speed at 60 rpm.

c. Slide the torque-testing arm over the shaft of the clutch and gear subassembly and tighten the setscrew.

d. Connect the spring scale to the torque-testing arm by means of a piece of string approximately one

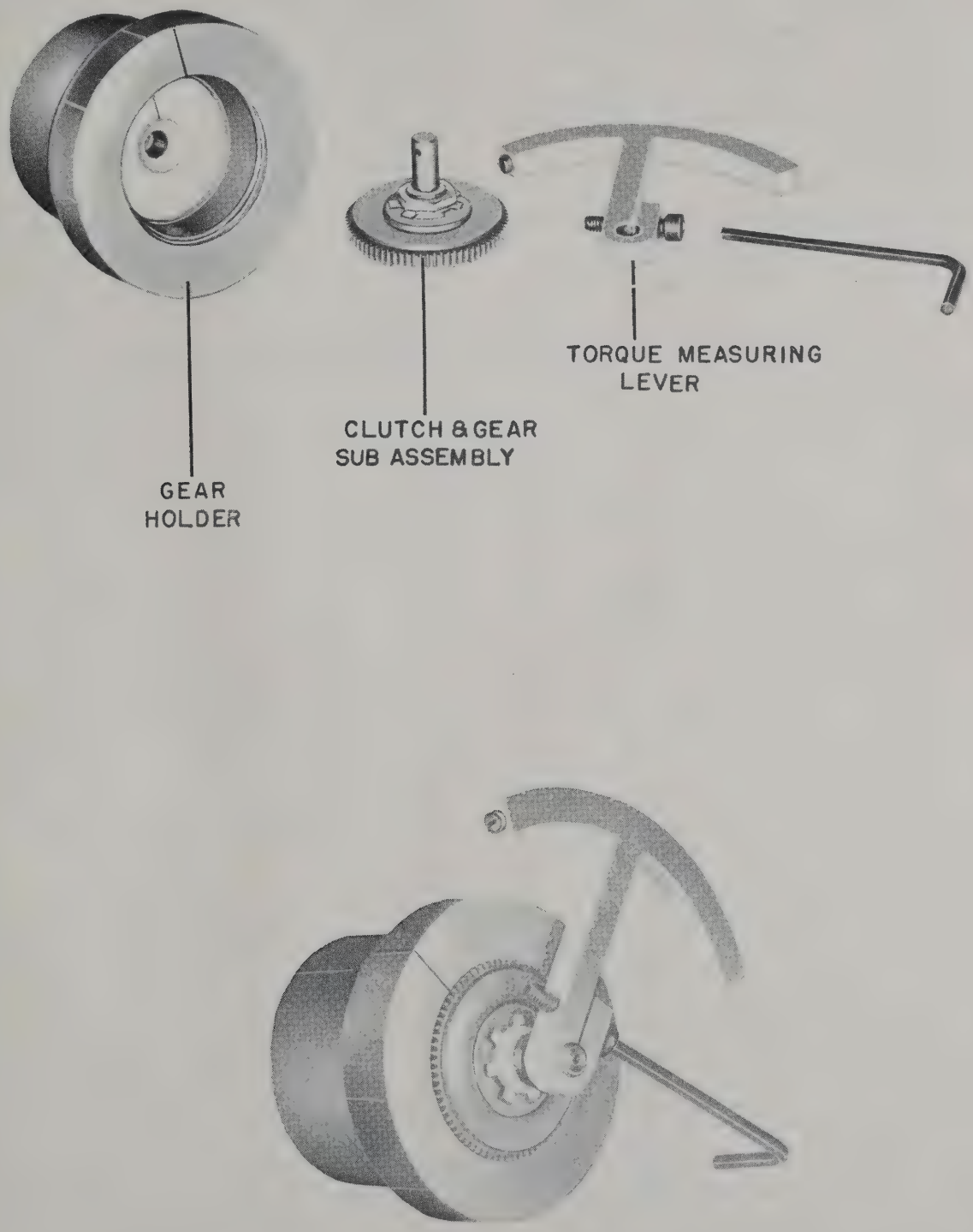


Figure 3–9. Type MS–309A, Friction Clutch Torque Adjusting Kit

foot in length and hold the scale vertically over the subassembly.

e. Run the lathe in the forward direction and hold the torque-testing arm stationary with the spring scale.

f. Multiply the reading of the scale by two for actual inch-pounds of torque being applied by the clutch.

Clutch	*Scale Reading*	*Torque Applied*
K1	1 pound 12 ounces	3-1/2 inch-pounds
K2	2 pound 4 ounces	4-1/2 inch-pounds

g. Obtain the proper scale reading by adjusting the nut (item 16) of the clutch and gear subassembly. Upon completing the adjustment, lock the nut in place with staking lacquer.

3–11. CONTINUITY CHECK OF THE FOUR-WIRE FREQUENCY CONTROL CIRCUITS.

a. Turn off the power to the transmitter.

b. Disconnect the jumper between pins number 26 and 27 on the Jones Plug P1.

c. Manually select the fraction-megacycle frequency positions as follows:

(1) Lift the brake pin of clutch K1 with a small screwdriver.

(2) Rotate, in the counterclockwise direction, the gear which is accessible through the circular opening in the side of the chassis (see figure 3–7) until the brake pin falls into the next slot.

d. Manually select the whole-megacycle frequency position as follows:

(1) Lift the brake pin of clutch K2 with a small screwdriver.

(2) Rotate, in the counterclockwise direction, the gear which is accessible through the circular opening in the side of the chassis (see figure 3–7) until the brake pin falls into the next slot.

TABLE 3–1. TYPICAL TUBE SOCKET VOLTAGE MEASUREMENTS

Symbol Number	*Pin Number*								
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*CAP*
V1	—	—	—	—	150	—	—	—	—
V101	—	3.5	12.6	6.3	215	100	3.5	—	—
V102	—	3.5	—	6.3	215	100	3.5	—	—
V103	–4.0	—	18.9	12.6	195	75	—	—	—
V104	–12	—	18.9	25.2	210	68	—	—	—
V201	—	2.3	6.3	—	200*	120	—	—	—
V202	20	6.3	185	20	—	20	—	—	220*
V203	25.2	—	220	58	18.9	—	12.6	—	450
V204	—	—	190	20	6.3	—	12.6	—	450
V301	10	12.6	125	10	—	10	6.3	—	195
V302	27.5	25.2	150	27.5	10	27.5	18.9	—	430–450
V303	27.5	18.9	150	27.5	10	27.5	12.6	—	430–450

Measurements to ground with 20,000 ohm-per-volt meter. Tolerance ±10 per cent.
* Measurement at cold end of plate coil.
Filaments measured with 27.5 volts dc at pin No. 16 of J2.
Microphone current approximately 50 ma at 27.5 volts.

TABLE 3–2. CONTINUITY CHECK OF FREQUENCY CONTROL CIRCUITS

Control Wire	*Rear Plug J2 Pin No.*	*Jones Plug J1/P1 Pin No.*	*Fractional-Megacycle Positions*																		
			.00	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95
E	3	3	O	O	X	X	O	O	X	X	X	X	O	O	O	O	X	X	X	X	X	X
F	4	4	X	X	O	O	X	X	O	O	X	X	X	X	O	O	O	O	X	X	X	X
G	5	5	X	X	X	X	O	O	X	X	O	O	X	X	X	X	O	O	O	O	X	X
H	6	6	X	X	X	X	X	X	O	O	X	X	O	O	X	X	X	X	O	O	O	O
K	12	21	X		X		X		X		X		X		X		X		X		X	
L	22	26		X		X		X		X		X		X		X		X		X		X

O — Indicates that the two wires are tied together but *not connected* to S1 side of K1 coil.
X — Indicates that the two wires are tied together and *connected* to S1 side of K1 coil.

Control Wire	*Rear Plug J2 Pin No.*	*Jones/Plug J1/P1 Pin No.*	*Whole-Megacycle Positions*																
			118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
				*		*		*		*		*		*		*		*		*
A	7	7	O	O	X	X	X	X	X	X	O	O	O	O	X	X	O	O	X	X
B	8	8	X	X	O	O	X	X	X	X	X	X	O	O	O	O	X	X	O	O
C	9	9	X	X	X	X	O	O	X	X	X	X	X	X	O	O	O	O	X	X
D	10	19	O	O	X	X	X	X	O	O	X	X	X	X	X	X	O	O	O	O
J	11	20	Tied together and connected to the control side of K3 coil.																	

* — K3 must be held in energized position.
O — Indicates that the two wires are tied together but *not connected* to S3 side of K2 coil.
X — Indicates that the two wires are tied together and *connected* to S3 side of K2 coil.

O = (-MD)
X = No

SECTION IV
PARTS LIST

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		MOTOR	
B1	Channel Selector Drive	Permanent magnet type, 27.5 vdc	C222677–4
		CAPACITORS	
C1	Motor Bypass	.006 mf ±20%, 200 vdcw, paper	CN20A602M
C2	Meter Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C3	Power Input Filter	4 mf +20% –10% 100 vdcw, paper	CP70E1FF405V
C4	L.V. Output Filter	4 mf +20% –10%, 600 vdcw, paper	CP70E1FF405V
C5	H.V. Output Filter	4 mf +20% –10%, 600 vdcw, paper	CP70E1FF405V
C101	L.F. Oscillator Grid Feedback	62 mmf ±2%, 300 vdcw, mica	C220129–18
C102	L.F. Oscillator Cathode Divider	30 mmf ±2%, 300 vdcw, mica	C220129–10
C103A	L. F. Oscillator Screen Bypass	.025 mf +60% –5% each section; 400 vdcw, paper, four identical sections	L220087–1
C103B	L.F. Oscillator Plate Bypass		
C103C	L.F. Oscillator Grid Bypass		
C103D	H.F. Oscillator Grid Bypass		
C104	Not Used		
C105	L.F. Oscillator Plate Blocking	470 mmf ±5%, 300 vdcw, mica	C220132–39
C106	L.F. Bandpass Primary Trimmer	Variable, 8–50 mmf, 350 vdcw, ceramic	C219054–3
C107	L.F. Bandpass Primary Tuning	270 mmf ±1%, 300 vdcw, mica	C220130–33
C108	L.F. Bandpass Secondary Tuning	240 mmf ±1%, 300 vdcw, mica	C220130–32
C109	L.F. Bandpass Secondary Trimmer	Variable, 8–50 mmf, 350 vdcw, ceramic	C219054–3
C110	H.F. Oscillator Grid Feedback	30 mmf ±2%, 300 vdcw, mica	C220129–10
C111	H.F. Oscillator Cathode Dividing	75 mmf ±1%, 300 vdcw, mica	C220130–20
C112	H.F. Oscillator Grid Bypass	510 mmf ±20%, 300 vdcw, mica	C220125–40
C113	H.F. Oscillator Screen Bypass	510 mmf ±20%, 300 vdcw, mica	C220125–40
C114	H.F. Oscillator Plate Bypass	510 mmf ±20%, 300 vdcw, mica	C220125–40
C115	H.F. Oscillator Plate Blocking	470 mmf ±5%, 300 vdcw, mica	C220132–29
C116	H.F. Bandpass Tuning	33 mmf ±2%, 300 vdcw, mica	C220129–11
C117	H.F. Bandpass Primary Trimmer	Variable, 5–25 mmf, 350 vdcw, ceramic	C219054–2
C118	H.F. Bandpass Secondary Tuning	68 mmf ±1%, 300 vdcw, mica	C220130–19
C119	H.F. Bandpass Secondary Tuning	68 mmf ±1%, 300 vdcw, mica	C220130–19
C120	H.F. Bandpass Secondary Trimmer	Variable, 5–25 mmf, 350 vdcw, ceramic	C219054–2
C121	Mixer Cathode Bypass	510 mmf ±10%, 300 vdcw, mica	C220133–40

PARTS LIST (cont'd)

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		CAPACITORS (cont'd)	
C122	Mixer Screen Bypass	1000 mmf ±10%, 500 vdcw, mica	CM25B102K
C123	Mixer Plate Tuning	Variable, air, 2 rotors and 2 stators each section	N204634–1
C124	Mixer Plate Trimmer	Variable air trimmer, 300 vdcw	C203892–1
C125	Mixer Plate Bypass	.01 mf ±20%, 300 vdcw, mica	CM35B103M
C126	L.F. Oscillator Grid Bypass	1000 mmf ±20%, 500 vdcw, mica	C220009–2
C127	Filament Bypass	1000 mmf ±20%, 500 vdcw, mica	C220009–2
C128	Mixer Cathode Bypass	510 mmf ±10%, 300 vdcw, mica	C220133–40
C129	Mixer Screen Bypass	1000 mmf ±10%, 500 vdcw, mica	CM25B102K
C201	Amplifier Cathode Bypass	.01 mf ±20%, 300 vdcw, mica	CM35B103M
C202	Amplifier Screen Grid Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C203	Amplifier Plate Tuning	Variable, 2 stators, 3 rotors, .025 in. spacing, air	Part of tuning capacitor OR205113–1
C204	Doubler Grid Coupling	68 mmf ±1%, 300 vdcw, mica	C220130–19
C205	Amplifier Plate Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C206	Doubler Grid Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C207	Doubler Cathode Bypass	.01 mmf ±20%, 300 vdcw, mica	CM35B103M
C208	Doubler Screen Grid Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C209	Doubler Plate Tuning	Variable, 2 stators, 2 rotors, .025 in. spacing, air	Part of tuning capacitor OR205113–1
C210	Doubler Plate Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C211	Tripler Grid Tuning	Variable, 2 stators, 2 rotors, split stator, air	Part of tuning capacitor OR205110–1
C212	Tripler Screen Grid Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C213	Tripler Plate Tuning	Variable, 2 stators, 3 rotors, split stator, air	Part of tuning capacitor OR205113–1
C214	Tripler Plate Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C215	P.A. Grid Tuning	Variable, 2 stators, 3 rotors, split stator, air	Part of tuning capacitor OR205110–1
C216	P.A. Grid Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C217	P.A. Screen Grid Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C218	P.A. Plate Tuning	Variable, 4 stators, 5 rotors, split stator, air	Part of tuning capacitor OR205113–1
C219	P.A. Plate Bypass	47 mmf, 2000 vdcw, mica	A220083–6
C220	Antenna Tuning	Variable, 25 mmf, air screwdriver adjustment	QB7751–25
C221	Tripler Cathode Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C222	R-F Amplifier Plate Tuning	Variable, 7.89–1.91 mmf, air, miniature type	C219353–3
C223	R-F Doubler Plate Trimmer	Variable, 7.89–1.91 mmf, air, miniature type	C219535–3
C224	R-F Tripler Grid Trimmer	Variable, 4 stators, 5 rotors, split stator, air	C203892–1
C225	R-F Tripler Plate Trimmer	Variable, 4 stators, 5 rotors, split stator, air	C203892–1

PARTS LIST (cont'd)

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		CAPACITORS (cont'd)	
C226	P.A. Grid Trimmer	Variable, 4 stators, 5 rotors, split stator, air	C203892–1
C227	P.A. Plate Trimmer	Variable, 4 stators, 5 rotors, split stator, air	C204667–1
C228	R-F Amplifier Grid Tuning	Variable, 1 stator, 2 rotors, .025 in. spacing, air	Part of tuning capacitor OR205110–1
C229	R-F Amplifier Grid Trimmer	Variable, 7.89–1.91 mmf, air, miniature type	C219535–3
C230	Amplifier Grid Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C231	Doubler Cathode Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C232	Tripler Grid Bypass	470 mmf ±10%, 500 vdcw, mica	CM20B471K
C233	P.A. Filament Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C235	L.V. B+ Bypass	.01 mf ±20%, 300 vdcw, mica	CM35B103M
C236	P.A. Filament Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C237	Tripler Filament Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C238	Tripler Filament Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C239	Tripler Filament Bypass	100 mmf ±10%, 500 vdcw, ceramic	CC30SL101K
C301	Input Equalizing	4 mf ±20% –10%, 100 vdcw, paper	CP53B1DB405K
C302	Feedback Equalizing	680 mmf ±10%, 500 vdcw, mica	CM30A681K
C303	P.A. Screen Loading	2200 mmf ±20%, 500 vdcw, mica	CM30A222M
C304	Feedback Blocking	.1 mf ±10%, 400 vdcw, paper	C220030–45
C305	Speech Amplifier Cathode Bypass	4 mf ±20% –10%, 100 vdcw, paper	CP53B1DB405K
C306	Speech Amplifier Screen Bypass	.1 mf ±10%, 400 vdcw, paper	C220030–45
C307	Speech Amplifier Equalizer	680 mmf ±10%, 500 vdcw, mica	CM30A681K
C501	Primary Input Filter	.03 mf ±20%, 200 vdcw, paper	C220025–23
C502	L.V. Hash Filter	.01 mf ±20%, 300 vdcw, mica	CM35B103M
C503	H.V. Hash Filter	.005 mf ±10%, 1000 vdcw, mica	C220023–502
		DYNAMOTOR	
D501	Plate and Screen High Voltage Supply	For 27.5 volts primary, output 225 volts and 450 volts	N221033–3
		TERMINAL BOARD	
E501	Dynamotor Terminal Board	Four terminals on phenolic board, screw type terminals	C63926–4
		CONNECTORS	
J1	Casting Disconnect	27-contact, male receptacle	C287022–1
J2	Power and Control	32-contact, male receptacle	A29282
J101	Disconnect	8-contact, male, cable disconnect	C223435–8
		RELAYS AND CLUTCHES	
K1	.05/.1-mc Positioning Clutch	20 detents, magnetically operated	N205865–4
K2	Whole-mc Positioning Clutch	18 detents, magnetically operated	N205865–3
K3	Odd-Even Control Clutch		C218259–3
K4	Antenna Transfer	Changover relay, coaxial type	L218378–1
K5	Dynamotor Start	27.5 vdc contacts, no bridging, 50 amp	C65180

PARTS LIST (cont'd)

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		COILS AND INDUCTORS	
L1	Motor B1 Filter	3.5 mh choke	AA104301–1
L2	Dynamotor Primary Filter	Choke, 2 layers of #11 square wire on phenolic form with iron core	A201906–1
L3	Hash Filter	Choke, 2 pi, approx 238 mh, iron form	C217364–1
L4	Hash Filter	Choke, 2 pi, approx 238 mh, iron form	C217364–1
L101	L.F. Oscillator Cathode	Choke, 2 mh ±5%	C215351–2
L102	H.F. Oscillator Cathode	Choke, 6 mh ±10%	C215350–4
L103	L.F. Bandpass Coil	L.F. oscillator output bandpass transformer	C215627–1
L104	Not Used		
L105	H.F. Primary Bandpass	1.35 mh, 14T #32 Formvar	C215631–1
L106	H.F. Secondary Bandpass	H.F. coupling and grid coils	C215630–1
L107	Mixer Plate Tuning	Sixteen turns CT #24 enamel	C215642–1
L108	L.F. Oscillator Grid Filter	Choke, 2 mh ±5%	C215351–2
L109	H.F. Oscillator Grid Filter	Choke, 2 mh ±5%	C215351–2
L201	R-F Amplifier Plate Tank	Slug tuned, variable	C215655–1
L202	Doubler Grid	Air wound coil V202 grid	A215170–2
L203	Doubler Plate	Slug tuned, variable	C215657–1
L204	Tripler Grid	Air wound, self supporting	C215644
L205	Tripler Plate	Air wound, self supporting	C215643
L206	P.A. Grid Tank	Air wound, self supporting	C215653
L207	Tripler Plate Choke	1/4 in. dia x 5/8 in. lg	A104301–1
L208	P.A. Plate Tank	1/8 in. copper tube	C215645
L209	P.A. Plate Choke	1/4 in. dia x 5/8 in. lg	A104301–1
L210	Antenna Coupling	1/8 in. copper tube	C215692
L211	R.F Amplifier Grid	Slug tuned, variable	C215656–1
L213	Tripler Grid Coupling	Single turn #14	A215693
L214	Tripler Plate Coupling	Single turn #14	A215694
L215	P.A. Grid Coupling	Single turn #14	A215695
L301	Microphone Filter	Choke, 2.8h at 50 ma, 210 ohms d-c resistance	C217308
		METER	
M1	Master	0–1 ma, basic meter, 1-3/4 in. sq	C222650–3
		PLUGS	
P1	Casting Disconnect	27-contact, female	C287023–1
P101	Disconnect	8-contact, female, cable disconnect	C223108–8
		RESISTORS	
R1	L.V. Plate Supply Bleeder	100,000Ω ±10%, 2W comp., fixed	RC40BF104K
R2	H.V. Plate Supply Bleeder	220,000Ω ±10%, 2W, comp., fixed	RC40BF224K
R3	Regulator Series	910Ω ±5%, 2W, comp., fixed	RC40BF911J
R4	Regulator Series	910Ω ±5%, 2W, comp., fixed	RC40BF911J
R5	Regulator Series	910Ω ±5%, 2W, comp., fixed	RC40BF911J
R6	Filament Dropping	12Ω ±10%, 5W, ww, fixed	C220520–120
R7	Filament Dropping	120Ω ±5%, 5W, ww, fixed	C220528–10
R8	Meter Shunt	910Ω ±5%, 1/2W comp., fixed	RC20BF911J
R9	Filament Dropping	2Ω ±10%, 5W, ww, fixed	C220520–2R0
R10	Filament Dropping	3.1Ω ±10%, 5W, ww, fixed	C220520–3R1

PARTS LIST (cont'd)

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		RESISTORS (cont'd)	
R101	L.F. Oscillator Grid Leak	18,000Ω ±5%, 1/4W, comp., fixed	RC10BF183J
R102	L.F. Oscillator Grid Meter Shunt	1000Ω ±5%, 1/4W, comp., fixed	RC10BF102J
R103	L.F. Oscillator Screen Dropping	150,000Ω ±5%, 1/4W, comp., fixed	RC10BF154J
R104	L.F. Oscillator Plate Load	3300Ω ±5%, 1/2W, comp., fixed	RC20BF332J
R105	L.F. Oscillator Plate Divider	100,000Ω ±5%, 1/4W, comp., fixed	RC10BF104J
R106	L.F. Bandpass Primary Load	18,000Ω ±5%, 1/4W, comp., fixed	RC10BF183J
R107	L.F. Bandpass Secondary Load	15,000Ω ±5%, 1/4W, comp., fixed	RC10BF153J
R108	H.F. Oscillator Grid Leak	12,000Ω ±5%, 1/4W, comp., fixed	RC10BF123J
R109	H.F. Oscillator Grid Meter Shunt	1000Ω ±5%, 1/4W, comp., fixed	RC10BF102J
R110	H.F. Oscillator Screen Dropping	68,000Ω ±5%, 1/4W, comp., fixed	RC10BF683J
R111	H.F. Oscillator Plate Loading	3300Ω ±5%, 1/2W, comp., fixed	RC20BF332J
R112	H.F. Oscillator Plate Decoupling	820Ω ±5%, 1/4W, comp., fixed	RC10BF821J
R113	H.F. Oscillator Plate Dividing	2700Ω ±5%, 1/4W, comp., fixed	RC10BF272J
R114	H.F. Bandpass Primary Loading	3300Ω ±5%, 1/4W, comp., fixed	RC10BF332J
R115	H.F.Bandpass Secondary Loading	2000Ω ±5%, 1/4W, comp., fixed	RC10BF202J
R116	Mixer Grid Leak	100,000Ω ±10%, 1/4W, comp., fixed	RC10BF104K
R117	Mixer Cathode Bias	1000Ω ±5%, 1/4W, comp., fixed	RC10BF102J
R118	Mixer Screen Dropping	150,000Ω ±5%, 1/4W, comp., fixed	RC10BF154J
R119	Mixer Plate Decoupling	3300Ω ±10%, 1/2W, comp., fixed	RC20BF332K
R120	Mixer Screen Dropping	150,000Ω ±5%, 1/4W, comp., fixed	RC10BF154J
R121	Mixer Cathode Bias	1000Ω ±5%, 1/4W, comp., fixed	RC10BF102J
R201	R-F Amplifier Plate	56Ω ±10%, 1/2W, comp., fixed	RC20BF560K
R202	R-F Amplifier Cathode	220Ω ±10%, 1/2W, comp., fixed	RC20BF221K
R203	R-F Amplifier Screen	47,000Ω ±10%, 1W, comp., fixed	RC30BF473K
R204	R-F Amplifier Grid	56Ω ±10%, 1/2W, comp., fixed	RC20BF560K
R205	R-F Amplifier Plate Filter	4700Ω ±10%, 1W, comp., fixed	RC30BF472K
R206	Doubler Grid	27,000Ω ±10%, 1/2W, comp., fixed	RC20BF273K
R207	Doubler Grid Meter Shunt	1000Ω ±5%, 1/2W, comp., fixed	RC20BF102J
R208	Doubler Cathode	220Ω ±10%, 1W, comp., fixed	RC30BF221K
R209	Doubler Screen	8200Ω ±10%, 1W, comp., fixed	RC30BF822K
R210	Doubler Plate	47Ω ±10%, 1W, comp., fixed	RC30BF470K
R211	Tripler Grid	12,000Ω ±10%, 1W, comp., fixed	RC30BF123K
R212	Tripler Grid Meter Shunt	51Ω ±5%, 1/2W, comp., fixed	RC20BF510J
R213	Tripler Screen Dropping	8200Ω ±10%, 1W, comp., fixed	RC20BF822K
R214	Tripler Plate Isolating	22Ω ±10%, 1W, comp., fixed	RC30BF220K
R215	P.A. Grid Leak	5600Ω ±10%, 2W, comp., fixed	RC40BF562K
R216A and B	Tripler Cathode Meter Shunts	10Ω each ±5%, 1/2W, comp., fixed	RC20BF100J
R217	Doubler Cathode Meter Shunt	10Ω ±5%, 1/2W, comp., fixed	RC20BF100J

PARTS LIST (cont'd)

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		RESISTORS (cont'd)	
R218	R-F Amplifier Grid Leak	100,000Ω ±10%, 1/2W, comp., fixed	RC20BF104K
R219	R-F and Doubler Plate Isolating	10Ω ±10%, 1W, comp., fixed	RC30BF100K
R220	Tripler Cathode	500Ω ±10%, 10W, ww, fixed	C220521–501
R221	Tripler Screen Isolating	120Ω ±10%, 1W, comp., fixed	RC30BF121K
R222	P.A. Grid Meter Shunt	51Ω ±5%, 1/2W, comp., fixed	RC20BF510J
R223	P.A. Screen Isolating	1000Ω ±10%, 2W, comp., fixed	RC40BF102K
R224 and R224A	P.A. Cathode Isolating	100Ω ±10%, 2W, comp., fixed	RC40BF101R
R225	Doubler Screen Isolating	470Ω ±10%, 1W, comp., fixed	RC30BF471K
R226	P.A. Plate Isolating	12Ω ±10%, 1W, comp., fixed	RC30BF120K
R227	Doubler Cathode Isolating	150Ω ±10%, 1/2W, comp., fixed	RC20BF151K
R228A, B and C	P.A. Cathode Meter Shunts	10Ω each ±5%, 1/2W, comp., fixed	RC10BF100J
R301	Not Used		
R302	Not Used		
R303	Microphone Gain	100,000Ω ±20%, 2W, comp., variable	A109267–39
R304	Microphone Load	27,000Ω ±10%, 1/4W, comp., fixed	RC20BF273K
R305	Driver Feedback	6800Ω ±10%, 1/4W, comp., fixed	RC20BF682K
R306	Driver Feedback Divider	47,000Ω ±10%, 1/2W, comp., fixed	RC20BF473K
R307	Driver Cathode Bias	330Ω ±10%, 1W, comp., fixed	RC30BF331K
R308	Driver Screen Dropping	56,000Ω ±10%, 1/2W, comp., fixed	RC20BF563K
R309	Modulator Bias Bleeder	120Ω ±5%, 5W, ww, fixed	C220528–10
R310	Modulator Bias Bleeder	160Ω ±5%, 5W, ww, fixed	C220528–11
R311	Sidetone Level	1000Ω ±20%, 2W, comp., variable	A109267–45
R312	Not used		
R313	Microphone Voltage Dropping	180Ω ±10%, 1W, comp., fixed	RC30BF181K
R314	Not used		
R315A and B	Modulator Cathode Meter Shunts	10Ω each ±5%, 1/4W, comp., fixed	RC10BF100J
		SWITCHES	
S1	.05/.1 Mc Clutch Positioning	Wafer, 20-position, rotary	C243193
S2	Whole-Mc Clutch Positioning	Wafer, 24-position, rotary	L243210
S3	Whole-Mc Clutch Positioning	Wafer, 24-position, rotary	L243205
S4	Meter Selector	Wafer, 9-position, 2 sections, 3 circuits, rotary	C218145–124
S5	Odd-Even Frequency Selector	Wafer, 20-position, rotary	C243192
S101	L.F. Crystal Selector	Wafer, 20-position, rotary	C243191
S102	H.F. Crystal Selector	Wafer, 24-position, rotary	L243207
		TRANSFORMERS	
T101	H.F. Bandpass	H.F. oscillator to mixer bandpass	L204617–1
T102	L.F. Bandpass	L.F. oscillator to mixer bandpass	L204169–1
T301	Not used		
T302	Microphone Input	Pri. 100Ω, sec. 125,000Ω (1:35.6) nominal level 7 db; d-c resistance pri. 13.3Ω, sec. 2070Ω	C217314

PARTS LIST (cont'd)

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		TRANSFORMERS (cont'd)	
T303	Driver	Pri. 13,500Ω, sec. 6000Ω, single plate to P.P. grids (1.5:1), nominal level +20 db; d-c resistance pri. 610Ω, sec. 133Ω G to G	C217310
T304	Modulation	Pri. 6200Ω, sec. plate 2670Ω, screen 7920Ω, sidetone 300Ω; nominal level 32.5W; turns ratio-pri. to plate 1.46:1; pri. to screen 3.06:1; pri. to sidetone 76:1; d-c resistance pri. 77Ω; sec. plate 127Ω, screen 15.7Ω, sidetone 1Ω	C217316
		VACUUM TUBES	
V1	Modulator Screen Voltage Regulator	Gas regulator tube type VR150/OD3	
V101	Balanced Mixer	Electron tube, pentode type 5654	
V102	Balanced Mixer	Electron tube, pentode type 5654	
V103	H.F. Oscillator	Electron tube, pentode type 5654	
V104	L.F. Oscillator	Electron tube, pentode type 5654	
V201	R-F Amplifier	Electron tube, pentode type 5654	
V202	R-F Doubler	Electron tube, beam power type 2E26	
V203	R-F Tripler	Electron tube, dual beam power type 829B	
V204	Power Amplifier	Electron tube, dual beam power type 829B	
V301	Modulator Driver	Electron tube, beam power type 2E26	
V302	Modulator	Electron tube, beam power type 2E26	
V303	Modulator	Electron tube, beam power type 2E26	
		COAXIAL CABLE	
W201	Transmitter to Antenna Relay	Type RG–58/U, 2 feet	
		SOCKETS	
X1	Voltage Regulator	Tube, octal type—8 pin	A113017–6
X101	Mixer	Tube, miniature—7 pin	C287037–3
X102	Mixer	Tube, miniature—7 pin	C287037–3
X103	H.F. Oscillator	Tube, miniature—7 pin	C287037–3
X104	L.F. Oscillator	Tube, miniature—7 pin	C287037–3
X105	L.F. Crystal	For 20 miniature crystals	C208594–1
X106	H.F. Crystal	For 18 miniature crystals	C208595–1
X201	R-F Amplifier	Tube, miniature—7 pin	C287037–3
X202	R-F Doubler	Tube, octal type—8 pin	A113017–6
X203	R-F Tripler	Special, for 829B tube	C223129–1
X204	Power Amplifier	Special, for 829B tube	C223129–1
X301	Modulator Driver Tube	Tube, octal type—8 pin	A113017–6
X302	Modulator	Tube, octal type—8 pin	A113017–6
X303	Modulator	Tube, octal type—8 pin	A113017–6
		MISCELLANEOUS	
	Capacitor Brackets	For mounting C4 and C5, with spade lugs	CP075B3
	Tube Shields	For type 5654 type tubes	C293048–4
	Tube Clamps	For V301, V302, V303, type 2E26 tubes	C241495–1

PARTS LIST (cont'd)

Symbol Designation	*Function*	*Name of Part and Description*	*Bendix Part Number*
		CRYSTALS	
Y101		3.7666 mc, fundamental frequency	L221923–1
Y102		3.7833 mc, fundamental frequency	L221923–2
Y103		3.8000 mc, fundamental frequency	L221923–3
Y104		3.8166 mc, fundamental frequency	L221923–4
Y105		3.8333 mc, fundamental frequency	L221923–5
Y106		3.8500 mc, fundamental frequency	L221923–6
Y107		3.8666 mc, fundamental frequency	L221923–7
Y108		3.8833 mc, fundamental frequency	L221923–8
Y109		3.9000 mc, fundamental frequency	L221923–9
Y110		3.9166 mc, fundamental frequency	L221923–10
Y111		15.900 mc, third mode	L221923–11
Y112		16.066 mc, third mode	L221923–12
Y113		16.233 mc, third mode	L221923–13
Y114		16.400 mc, third mode	L221923–14
Y115		16.566 mc, third mode	L221923–15
Y116		16.733 mc, third mode	L221923–16
Y117		16.900 mc, third mode	L221923–17
Y118		17.066 mc, third mode	L221923–18
Y119		17.233 mc, third mode	L221923–19
Y120		17.400 mc, third mode	L221923–20
Y121		17.566 mc, third mode	L221923–21
Y122		17.733 mc, third mode	L221923–22
Y123		17.900 mc, third mode	L221923–23
Y124		18.066 mc, third mode	L221923–24
Y125		18.233 mc, third mode	L221923–25
Y126		18.400 mc, third mode	L221923–26
Y127		18.566 mc, third mode	L221923–27
Y128		18.733 mc, third mode	L221923–28
Y101A		3.7750 mc, fundamental frequency	*L221923–29
Y102A		3.7916 mc, fundamental frequency	*L221923–30
Y103A		3.8083 mc, fundamental frequency	*L221923–31
Y104A		3.8250 mc, fundamental frequency	*L221923–32
Y105A		3.8416 mc, fundamental frequency	*L221923–33
Y106A		3.8583 mc, fundamental frequency	*L221923–34
Y107A		3.8750 mc, fundamental frequency	*L221923–35
Y108A		3.8916 mc, fundamental frequency	*L221923–36
Y109A		3.9083 mc, fundamental frequency	*L221923–37
Y110A		3.9250 mc, fundamental frequency	*L221923–38

* These crystals used only when unit is operating at 50 kc, spacing.

EXTRA SCHEMATIC DIAGRAM

An extra schematic diagram is provided for the convenience of maintenance personnel.

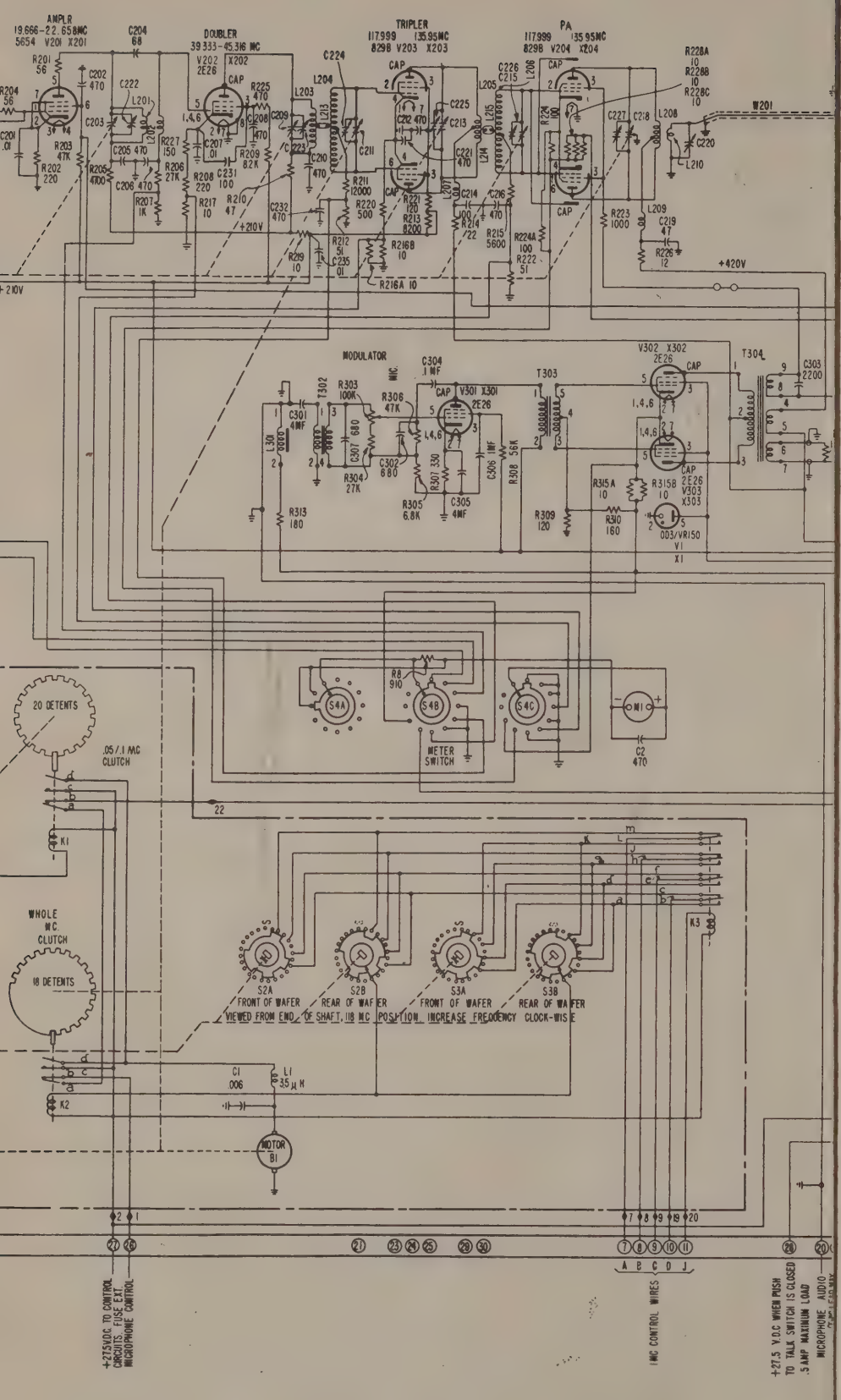
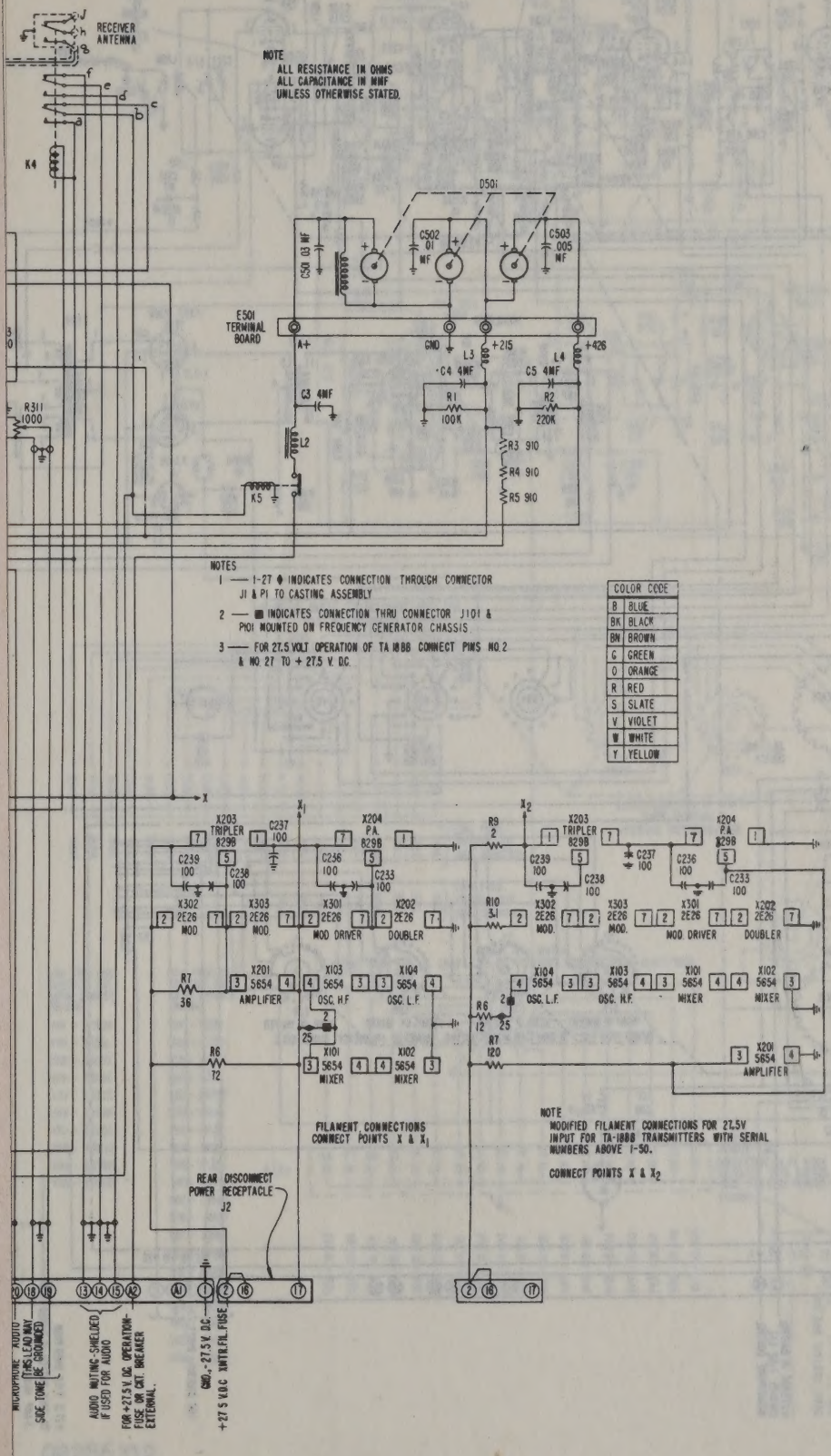

AMPLR
19.666-22.658MC
5654 V201 X201
DOUBLER
39.333-45.316 MC
TRIPLER
117.999 135.95MC
8298 V203 X203
PA
117.999 135.95MC
8298 V204 X204
MODULATOR
MIC.
V302 X302
2E26
T304
V301 X301
T303
V303 X303
OD3/VR150
V1
X1
+420V
+210V
20 DETENTS
.05/.1 MC
CLUTCH
WHOLE
MC.
CLUTCH
18 DETENTS
METER
SWITCH
S2A
FRONT OF WAFER
S2B
REAR OF WAFER
S3A
FRONT OF WAFER
S3B
REAR OF WAFER
VIEWED FROM END OF SHAFT. 118 MC POSITION. INCREASE FREQUENCY CLOCK-WISE
MOTOR
B1
+27.5VDC TO CONTROL
CIRCUITS FUSE EXT.
MICROPHONE CONTROL
MC CONTROL WIRES
+27.5 V.D.C WHEN PRSH
TO TALK SWITCH IS CLOSED
.5 AMP MAXIMUM LOAD
MICROPHONE AUDIO

Figure 4–1



1. *Type TA–18BB Transmitter, Schematic Diagram*

BENDIX RADIO

DIVISION OF BENDIX AVIATION CORPORATION

BALTIMORE 4, MARYLAND